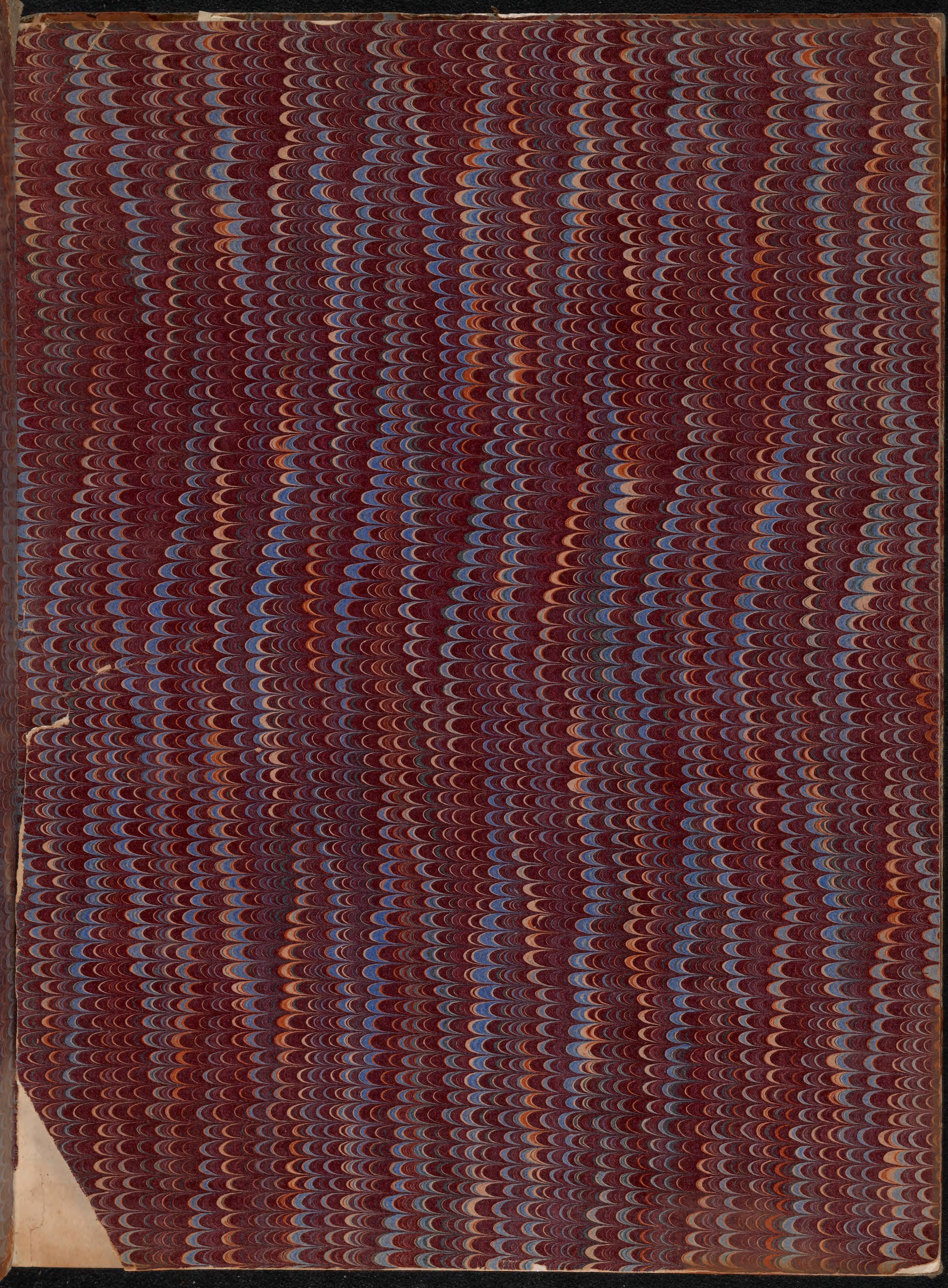
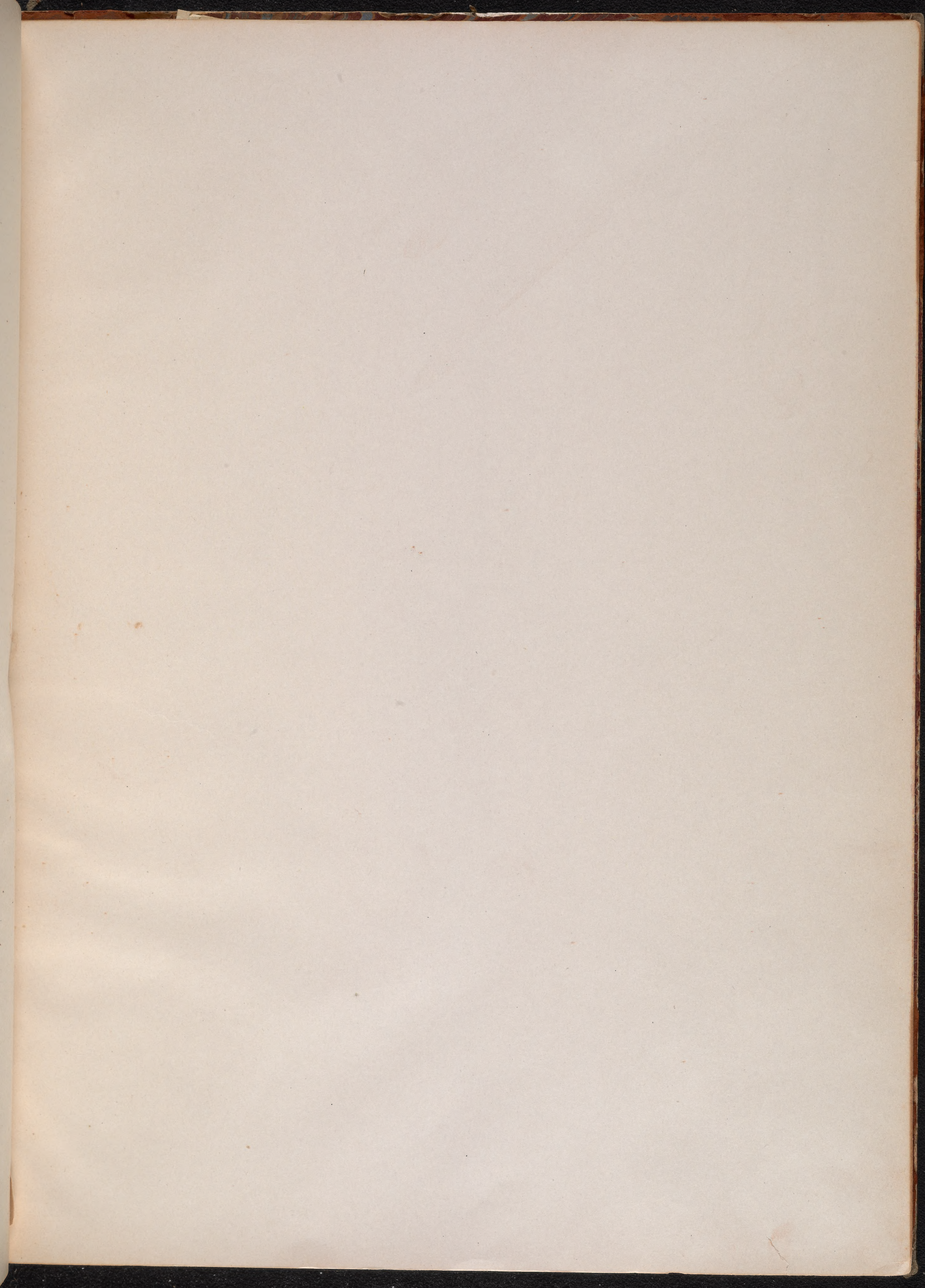


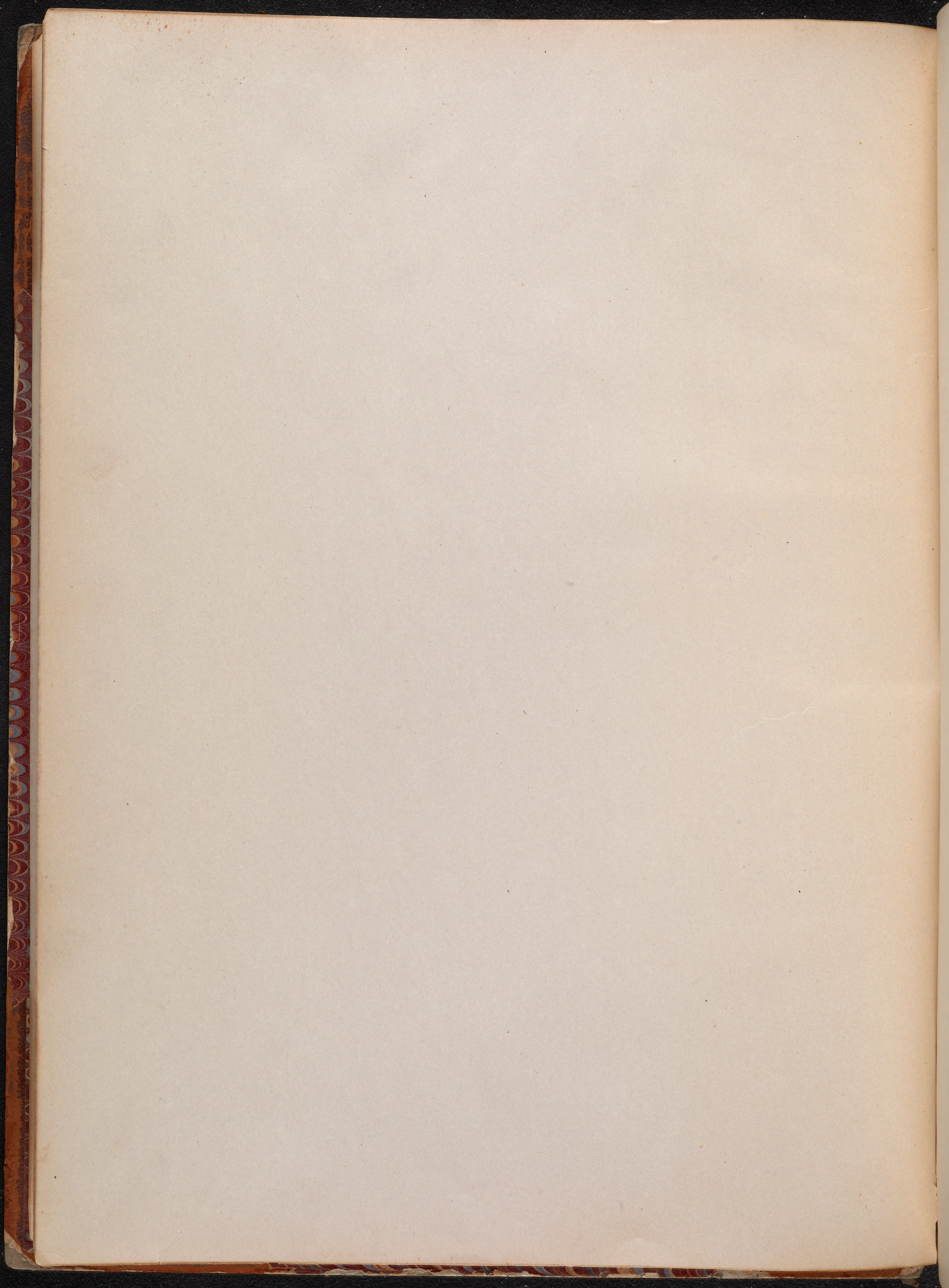
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DEN NORSKE NORDHAVS-EXPEDITION
1876—1878.

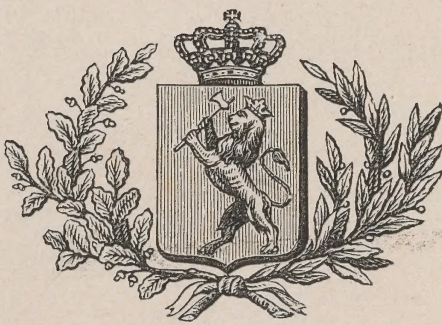
ZOOLOGI.

POLYZOA.

VED

O. NORDGAARD.

MED 1 PLANCHE OG 1 KART.



CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1900.

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THE NORWEGIAN NORTH-ATLANTIC EXPEDITION
1876—1878.

ZOOLOGY.

POLYZOA.

BY

O. NORDGAARD.

WITH 1 PLATE AND 1 MAP.



169534

CHRISTIANIA.
PRINTED BY GRØNDAHL & SØN.
1900.



I det følgende har jeg leveret en systematisk for-
tegnelse over de polyzoer, som indsamledes under Nord-
havsekspektionen. Forat der ikke skal reises tvil om hvilke
former, jeg har ment, er der angivet etpar steder, hvor der
findes en ordentlig beskrivelse af arten. I regelen har jeg
henvist til Smitt og Hincks. Tallene i () refererer sig til
litteraturfortegnelsen.

Bergen, oktober, 1899.

I have here given a systematic list of the Polyzoa
collected during the North Atlantic Expedition. In order
that there shall be no doubt as to which forms I have
meant, two or three places are mentioned where a proper
description of the species is to be found. I have gene-
rally referred to Smitt and Hincks. The figures in brackets
refer to the Bibliography.

Bergen. October, 1899.

Cheilostomata.

Fam. Eucratidae.

Gen. Gemellaria.

Gemellaria loricata, Linn.

Smitt, (24, III), p. 286, 324, tab. 17, fig. 54.

Hincks, (8), p. 18, tab. 3, fig. 1—4.

Findesteder. St. 315, 322, 343, 363, Spitsbergen.

Arten har stor udbredelse paa grundt vand i arktiske farvand. Den er saaledes tagen paa begge sider af det amerikanske kontinent, er karakteristisk for de grunde sund i Finmarken og forekommer ogsaa i mængde og frodig udvikling ved den finmarkske havkyst, f. eks. ved Nordkap og Nordkyn.

Fam. Cellulariidae.

Gen. Menipea.

Menipea ternata, Ell. et Sol.

Cellularia ternata, Smitt, (24, III), p. 282, 305, tab. 16, fig. 10—26.

Menipea ternata, Hincks, (8), p. 38, tab. 6, fig. 1—4.

Findesteder. Kjosen, St. 223, Beeren Eiland, Spitsbergen.

Ligesom foregaaende er denne ogsaa en af de almindeligste arktiske polyzoer. De forskellige arter, som er opstillede inden Smitts *Cellularia ternata*-gruppe, bør vistnok rettest opfattes som varieteter.

Cheilostomata.

Fam. Eucratidæ.

Gen. Gemellaria.

Gemellaria loricata, Linn.

Smitt (24, III), pp. 286, 324; Pl. XVII, fig. 54.

Hincks (8), p. 18; Pl. III, figs. 1—4.

Occurrence. St. 315, 322, 343, 363, Spitsbergen.

This species has a wide distribution in shallow water in the arctic seas. It was taken, for instance, on both sides of the American continent, is characteristic of the shallow sounds in Finmark, and occurs also in quantities, and in a state of vigorous development on the Finmark coast, e. g. at the North Cape and at Nordkyn.

Fam. Cellulariidæ.

Gen. Menipea.

Menipea ternata, Ell. & Sol.

Cellularia ternata, Smitt (24, III), pp. 282, 305; Pl. XVI, figs. 10—26.

Menipea ternata, Hincks (8), p. 38; Pl. VI, figs. 1—4.

Occurrence. Kjosen, St. 223, Bear Island, Spitsbergen.

This, like the preceding species, is one of the commonest arctic Polyzoa. The various species which have been set up in Smitt's *Cellularia ternata* group, ought more properly to be regarded as varieties.

Menipea jeffreysii, Norman.

Hincks, (8), p. 42, tab. 9, fig. 1—2.

Norman, (17, vol. 12), p. 446, tab. 19, fig. 1.

Nordgaard, (18, I), p. 11, tab. 2, fig. 5.

Findesteder. St. 10, 18.

Arten er tagen hist og her langs Norges kyst fra Bergen til Østfinmarken; er forøvrigt kun kjendt fra Shetland. Jeg har i de to sidste aar fundet den flere gange i fjordene ved Bergen. Alle de eksemplarer, jeg har seet, har været forsynede med det eiendommelige kitinøse støtteapparat.

Menipea normani, n. sp.*).

Tab. I, fig. 2—8.

Findesteder. St. 31, 200, 323.

Jeg har vistnok ikke havt tilstrækkelig litteratur til at gjøre mig bekendt med alle *menipea*-arter, som er opført i Jelley's katalog, men da jeg tror, det er overveiende sandsynlighed for, at den *Menipea*, jeg har havt mellem hænder, er ny og ubeskreven, vil jeg her i korthed karakterisere den.

Zoariet udspringer fra en enkelt stamme, som er sammensat af kitintuber, og hvis nedre ende er fæstet til en smaasten eller lignende. Grenene er dikotomisk delte og ligger ikke alle i samme plan. De er støttede af kitintuber, som næsten udelukkende forløber efter bagsiden. Zoócierne er forlængede og ordnede i en dobbeltrække. Munden oval og mundingranden noget ophøiet. Ved den distale rand sidder 3—5 børster eller pigger. Disse kan paa de ypperste zoócier i grenene have en længde af 0.8—1.0 mm.

Der er to slags avicularier. De laterale er ganske smaa, og de sidder saa langt bagud, at de tildels ikke sees, naar grenen ligger i frontstilling. Derimod rager frontaviculariet, som er fæstet lige under den proximale mundingrand, langt frem over munden. Den lille mandibel, som sidder i toppen, er rettet nedad. Oócierne længde er større end bredden, paa mange forekommer bugtede fortykkelser i frontvæggen. Til operculum saaes ikke spor af antydning. Kolonierne var ikke saa godt konserverede, at noget sikkert kan siges om polypidet.

De oven omtalte kitintuber udspringer fra den nederste del af zoócierne, hvorefter de forløber efter zoócierne bagside for tilslut at samle sig i en enkelt stamme, som saaledes bestaar af en bundt af kitinrør. I dette stykke er der altsaa stor overensstemmelse mellem *M. jeffreysii* og

*) Opkaldt efter the Rev. Canon Norman, som har leveret store bidrag til udforskningen af vor marine fauna.

Menipea jeffreysii, Norman.

Hincks (8), p. 42; Pl. IX, figs. 1, 2.

Norman (17, Vol. 12), p. 446; Pl. XIX, fig. 1.

Nordgaard (18, I), p. 11; Pl. II, fig. 5.

Occurrence. St. 10, 18.

This species is found here and there along the coast of Norway from Bergen to East Finmark. Otherwise it is only known from the Shetland Isles. During the last two years, I have found it several times in the fjords round Bergen. All the specimens I have seen, have been furnished with the peculiar, chitinous case.

Menipea normani, n. sp.*).

Pl. I, figs. 2—8.

Occurrence. St. 31, 200, 323.

My knowledge of the literature on this subject is not sufficient to have made me acquainted with all the *Menipea* species that appear in Jelley's catalogue; but as I think there is every probability that the *Menipea* I have had in my hands is new and hitherto undescribed, I will here briefly characterise it.

The zoarium springs from a single stem which is composed of chitinous tubes, and whose lower end is attached to a small stone or something similar. The branches are dichotomous, and do not all lie in the same plane. They are supported by chitinous tubes, which run almost exclusively along the posterior side. The zoecia are elongated, and arranged in a double row. The mouth is oval, and its edges somewhat elevated. On the distal margin there are from 3 to 5 bristles or spines. On the outermost zoecia in the branch, these may be from 0.8 to 1 mm. in length.

There are two kinds of avicularia. The lateral are quite small, and are placed so far back that they sometimes cannot be seen when the branch is viewed from the front. The front avicularium, on the other hand, which is attached just below the proximal margin of the aperture, extends far over the aperture. The little mandible, which is situated at the top, is directed downwards. The length of the oecia is greater than their breadth; in many there are curved expansions of the anterior wall. There is no sign of any operculum. The colonies were not in such a good state of preservation as to allow of anything certain being said about the polypides.

The above-mentioned chitinous tubes spring from the lowest part of the zoecia, and then run along their posterior side, to unite at last in a single stem, which thus consists of a bundle of chitinous tubes. In this respect therefore, there is a great similarity between *M. jeffreysii*

*) Named after the Rev. Dr. Norman, who has made large contributions to the knowledge of our marine fauna.

*M. normani**). Man ser ogsaa tildels, at en kitintube forløber langs en bifurkation paa samme maade, som fremstillet af Norman (Notes on rare British Polyzoa, Quarterly Journ. Mic. Sc., vol. 8, n. s., tab. 5, fig. 6). Mellem rodtraadene (tubular fibres, radical fibres) hos *M. ternata* og kitintuberne hos de to andre arter er der neppe nogen anden forskjel end, at de hos den første udspringer under en ret vinkel, mens de hos *M. jeffreysii* og *M. normani* udspringer saa spidsvinklet, at de løber efter zoariet, for hvilket tuberne saaledes tjener som et effektivt støtteapparat.

Fra *M. jeffreysii* adskilles min art let ved sine store frontavicularier og manglende operculum.

Det kan have sin interesse at stille sig for øie de naturlige forhold paa de tre steder, hvor arten forekom:

St. 31, 763 m., sandler, $t = \div 1.00^{\circ} \text{C.}$

„ 200, 1134 - , ler , $t = \div 1.00^{\circ} -$

„ 323, 408 - , ler , $t = 1.05^{\circ} -$

Den er saaledes hentet op fra et dyb af 1154 meter med iskoldt vand, og sammen med *Kinetoskias arborescens* deler den æren af at have levet i en afstand fra sjøens overflade som er større end 1000 meter.

Koloniernes længde 3—6.5 cm.

Zoöciemundingsens længde 0.3 mm.

— bredde 0.14 „

Frontaviculariets længde 0.24—0.3 „

Kitintubernes tykkelse 0.036—0.06 „

Gen. *Scrupocellaria*.

Scrupocellaria reptans, Linn.

Cellularia reptans, Smitt, (24, III), p. 284, 318, tab. 17, fig. 37—41.

Scrupocellaria reptans, Hincks, (8)- p. 52, tab. 7, fig. 1—7.

Findested. Brandø Sund.

Denne art vides ikke med sikkerhed at være observeret i den arktiske del af vort land. M. Sars (22) opfører vistnok *Cellularia reptans* som almindeligt forekommende i Havø Sund og ved Hammerfest, men det foreligger sandsynligvis her en forveksling med *Menipea ternata*. Baade Norman og jeg har taget arten i Trondhjemsfjorden, men nordenfor er den endnu ikke funden.

*) I min fortegnelse har jeg tydet disse kitintuber som hydroidrør (18, II, p. 11, tab. 2, fig. 5). Dette er nok ikke rigtigt. Vistnok finder man ofte ogsaa ledsagende hydroider saaledes som angivet paa min ovenciterede figur, men de egentlige kitintuber udspringer baade hos *M. normani* og *M. jeffreysii* fra zoöciernes nederste parti, og de maa saaledes kunne opfattes som svarende til rodtraadene hos *M. ternata*.

and *M. normani**). A chitinous tube may also sometimes be seen running along a bifurcation in the way described by Norman (Notes on Rare British Polyzoa. Quarterly Journ. Micros. Sci., Vol. 8, n. s. Pl. V, fig. 6). There is hardly any difference between the radical fibres in *M. ternata*, and the chitinous tubes in the two other species, except that in the first they spring out at right angles, while in *M. jeffreysii* and *M. normani* they spring out at such an acute angle that they follow the zoarium, and thus serve as an effective support.

My species is easily distinguished from *M. jeffreysii* by its large anterior avicularia and the absence of an operculum.

It may be interesting to observe the natural conditions in the three places where the species occurred. These were as follows:

St. 31, depth 763 m., sandy clay, temp. — 1.00°C.

„ 200, „ 1134 - , clay , „ — $1.00^{\circ} -$

„ 323, „ 408 - , clay , „ $1.50^{\circ} -$

It has thus been brought up from a depth of 1134 metres, from ice-cold water; and it shares with *Kinetoskias arborescens* the honour of having lived at a distance of more than 1000 metres below the surface of the sea.

Length of colony from 3—6.5 cm.

Length of the aperture 0.3 mm.

Breadth of the „ 0.14 „

Length of anterior avicularium from 0.24—0.3 „

Thickness of chitin tubes from 0.036—0.06 „

Gen. *Scrupocellaria*.

Scrupocellaria reptans, Linn.

Cellularia reptans, Smitt (24, III), pp. 284, 318; Pl. XVII, figs. 37—41.

Scrupocellaria reptans, Hincks (8), p. 52; Pl. VII, figs. 1—7.

Occurrence. Brandø Sund.

This species is not known with certainty to have been observed in the arctic portion of Norway. M. Sars (22), indeed, specifies *Cellularia reptans* as of common occurrence in Havø Sund and at Hammerfest; but this is probably through confounding it with *Menipea ternata*. Both Norman and I have found the species in the Trondhjem Fjord, but farther north it has not yet been found.

*) In my list, I have interpreted these chitinous tubes as hydroid tubes (18, II, p. 11; Pl. II, fig. 5). This is not correct. It is true that accompanying hydroids are often found as represented in my above-mentioned figure; but the true chitin tubes, both in *M. normani* and *M. jeffreysii*, spring from the lowest portion of the zoecia, and might thus be supposed to answer to the root fibres in *M. ternata*.

Fam. **Bicellaridae.**Gen. **Bicellaria.****Bicellaria alderi**, Busk.

Smitt (24, III), p. 289, 335, tab. 18, fig. 4—8.
Hincks (8), p. 70, tab. 9, fig. 3—7.

Findesteder. St. 10, 315.

Levinson (14) opfører ikke den form for Danmark, men ifølge Hincks er den tagen ved Shetland, og i Norge har jeg observeret arten paa forskellige steder fra Bergen til Lofoten. Den er hidtil ikke omtalt fra arktiske egne, og naar saaledes arten pludselig viser sig saa langt mod nord som paa St. 315 (74° 53' N. B.), maa denne omstændighed vistnok kunne anføres som et eksempel paa Golfstrømmens evne til at flytte boreale former mod højere breddegrader.

Anm. I min fortegnelse over norske *Cheilostomata* (18, I) har jeg opført *Bicellaria ciliata*, Linn. som funden af M. Sars i Kristianiafjorden. Jeg har senere taget denne vakre form paa *Bicellaria alderi* i Hjeltefjorden, og arten kan saaledes med sikkerhed opføres som hørende til Norges fauna.

Gen. **Bugula.****Bugula murrayana**, Johnst.

Smitt (24, III), p. 291, 349, tab. 18, fig. 19—27.
Hincks (8), p. 92, tab. 14, fig. 2—9.

Findesteder. St. 260, 322, Spitsbergen.
Var. *fruticosa*, Pack, Advent Bay.
Var. *quadridentata*, Lov., St. 10, 18, 262, 315.

I arktiske farvand synes varieteterne at være almindeligere end den typiske form.

Bugula purpurotineta, Norman.

Hincks (8), p. 89, tab. 12, fig. 8—12.

Findested. Kjosen.

Arten er funden paa forskellige steder langs Skandinaviens kyst, men den nordligste hidtil kjendte forekomst er Kjosen. Jeg tog den vinteren 1899 i Malangenfjord fastvokset til en hydroid (100—200 m.).

Fam. **Bicellaridæ.**Gen. **Bicellaria.****Bicellaria alderi**, Busk.

Smitt (24, III), pp. 289, 335; Pl. XVIII, figs. 4—8.
Hincks (8), p. 70; Pl. IX, figs. 3—7.

Occurrence. St. 10, 315.

Levinson (14) does not give this form for Denmark, but according to Hincks it is found in the Shetland Isles, and I have observed the species in Norway in several places from Bergen to Lofoten. It has not yet been reported from arctic regions; and when the species thus suddenly appears so far north as St. 315 (74° 53' N. Lat.), the circumstance might certainly be quoted as an instance of the power of the Gulf Stream to carry boreal forms up into higher latitudes.

Remark. In my list of Norwegian *Cheilostomata* (18, I), I have entered *Bicellaria ciliata*, Linn. as found by M. Sars in the Kristiania Fjord. I have since found this beautiful form on *Bicellaria alderi* in Hjeltefjorden; and the species may thus safely be put down as belonging to the fauna of Norway.

Gen. **Bugula.****Bugula murrayana**, Johnst.

Smitt (24, III), pp. 291, 349; Pl. XVIII, figs. 19—27.
Hincks (8), p. 92; Pl. XIV, figs. 2—9.

Occurrence. St. 260, 322, Spitsbergen;
Var. *fruticosa*, Pack, Advent Bay;
Var. *quadridentata*, Lov, St. 10, 18, 262, 315.

In arctic waters, the varieties seem to be more general than the typical form.

Bugula purpurotineta, Norman.

Hincks (8), p. 89; Pl. XII, figs. 8—12.

Occurrence. Kjosen.

This species is found in various places along the coast of Scandinavia; but the most northerly place at which it has hitherto been known to occur is Kjosen. I found it at the beginning of 1899 in Malangenfjord, grown fast to a hydroid (100—200 m.).

Gen. **Kinetoskias**.**Kinetoskias smittii**, Koren et Dan.

Koren et Danielsen (13), p. 104, tab. 3, fig. 12—14, tab. 12, fig. 4—8.

Norman (17, vol. 12), p. 448, tab. 19, fig. 2—4; vol. 13, p. 112.

Denne art forekom vistnok ikke blandt Nordhavsekspe-
ditionens materiale, men jeg tager den med her alligevel,
fordi jeg vinteren 1899 tog den blandt andre steder ogsaa
i den indre del af Vestfjorden, som gik ind under ekspe-
ditionens undersøgelsesfelt.

Det har ogsaa sin interesse, at *K. smittii* hører til
de polyzoer, som gaar dybest ned.

I Tranödybet (Vestfjorden) tog jeg nemlig 16de Marts
1899 et eksemplar i en dybde af 607—640 m. Arten er
funden paa forskellige steder langs den norske fra Kors-
fjorden til Slotholmen i Nordland.

Kinetoskias arborescens, Koren et Dan.

Koren et Dan. (13), p. 107, tab. 12, fig. 9—14.

Bugula umbella, Smitt (24, III), p. 292, 353, tab. 19, fig.
28—31.

Findesteder. St. 2, 23, 31.

Norman (17, vol. 13) har undersøgt eksemplarer fra
Karahavet og St. Lawrence og paa de førstnævnte tillige
fundet oócier, som lignede oócierne hos den foregaaende art.

Kinetoskias arborescens er hidtil kun funden i et eks-
emplar i Wijde Bay, Spitsbergen, i 40 favnes dyb, lerbund,
af prof. Lovén. Dijnphna-ekspeditionen tog diverse eks-
emplarer i Karahavet (Levinsen). Danielsen tog etpar ved
Vadsø (90 favne, lerbund), endvidere er arten kjendt fra
St. Lawrencebugten (Whiteaves). Det er saaledes inter-
essant at kunne konstatere artens tilstedeværelse paa St. 2
(Sognefjorden). Paa dette sted var dybden 1229 meter,
hvilket er den største hidtil kjendte sænkning af bunden i
nogen norsk fjord. Bunden bestod af sandig ler og tem-
peraturen paa dybet 6^o.7 C.

Fam. **Cellariidae**.Gen. **Cellaria**.**Cellaria fistulosa**, Linn.

Smitt (24, III), p. 362, 386, tab. 20, fig. 18—20.

Hincks (8), p. 106, tab. 13, fig. 1—4.

Denne art forekom blandt det mig tilstillede mate-
riale, men uden angivelse af findested. Jeg har ellers taget
samme paa forskellige steder fra Bergen til Lofoten.

Gen. **Kinetoskias**.**Kinetoskias smittii**, Koren & Dan.

Koren & Danielsen (13), p. 104; Pl. III, figs. 12—14;
Pl. XII, figs. 4—8.

Norman (17, Vol. XII), p. 448; Pl. XIX, figs. 2—5;
Vol. 13, p. 112.

This species did not, indeed, occur in the North At-
lantic Expedition's collection, but I nevertheless include it
here, because, among other places, I found it, in the early
part of 1899, in the inner part of Vestfjorden, which was
included in the Expedition's field of investigation.

It is also of some interest to note that *K. smittii*
belongs to those Polyzoa that go deepest.

In Tranödybet (Vestfjord) on the 16th March, 1899,
I took one specimen from a depth of between 607 and
640 metres. The species is found in various places along
the Norwegian coast from Korsfjorden to Slotholmen in
Nordland.

Kinetoskias arborescens, Koren & Dan.

Koren & Danielsen (13), p. 107; Pl. XII, figs. 9—14.

Bugula umbella, Smitt (24, III), pp. 292, 353; Pl. XIX,
figs. 28—31.

Occurrence. St. 2, 23, 31.

Norman (17, vol. 13) has examined specimens from
the Kara Sea and St. Lawrence, and on the former found
oöcia that resembled the oöcia in the preceding species.

Only one specimen of *Kinetoskias arborescens* has
hitherto been found in Wijde Bay, Spitsbergen, at a depth
of 40 fathoms, clay bottom, by Prof. Lovén. The Dijnphna
Expedition found several specimens in the Kara Sea (Le-
vinsen). Danielsen found a few at Vadsø (90 fathoms,
clay bottom), and the species is further known from the
Gulf of St. Lawrence (Whiteaves). It is thus interesting
to be able to prove the presence of the species at Station
2 (Sogne Fjord). The depth here was 1229 metres, which
is the greatest depression of the bottom hitherto known in
any Norwegian fjord. The bottom consisted of sandy clay,
and the temperature there was 6.7^o C.

Fam. **Cellariidæ**.Gen. **Cellaria**.**Cellaria fistulosa**, Linn.

Smitt (24, III), pp. 362, 386; Pl. XX, figs. 18—20.

Hincks (8), p. 106; Pl. XIII, figs. 1—4.

This species occurred in the collection sent to me,
but there was no statement as to where it was found. I
have also found the same species in various places between
Bergen and Lofoten.

Fam. Flustridae.

Gen. Flustra.

Flustra membranaceo-truncata, Smitt.

Smitt (24, III), p. 358, 376, tab. 20, fig. 1—5.

Findesteder. St. 262, 223 (Jan Mayen).

Denne *Flustra* er tagen paa mange steder i den arktiske zone fra Novaja Semlja til Grønland. Hincks (9) opfører den ogsaa fra Queen Charlotte Islands. Den er ny for Jan Mayen (st. 223). Efter sin forekomst maa denne form karakteriseres som en ægte arktisk *Flustra*, den er saaledes ikke iagttaget ved Storbritanniens kyst, og er endnu heller ikke funden ved Island.

Flustra carbacea, Ell. et Sol.

Flustra papyrea, Smitt (34, III), p. 359, 380, tab. 20, fig. 9—11.

Flustra carbacea, Hincks (8), p. 123, tab. 16, fig. 4, 4a; tab. 14, fig. 1.

Findested. Kjosen (10—14 favne).

Denne art har ogsaa en stor arktisk udbredelse og findes desuden ved Storbritanniens og Danmarks kyster.

Flustra abyssicola, M. Sars.

G. O. Sars (21), p. 19, tab. 2, fig. 25—30.

Findesteder. St. 149 (Vestfjorden), 260 (Porsangerfjorden), 290, 323, 363.

Siden G. O. Sars fandt denne eiendommelige dybvandsflustra ved Guldbrandsøerne og Skroven (Vestfjorden) er den tagen i Gulf of St. Lawrence (Whiteaves) samt i Karahavet (Smitt).

Det største dyb, hvorfra arten blev hentet op paa Nordhavsekspeditionen var 475 m. (St. 363, lerbund, temp. 1° 1 C.) og det mindste 247 m. (St. 149, lerbund, temp. 4° 9 C.). Aviculariernes primitive form, koloniens rigide beskaffenhed og forekomsten paa store dyb tyder paa, at *F. abyssicola* er senior blandt de nulevende nordlige repræsentanter af slekten *Flustra*.

Fam. Flustridæ.

Gen. Flustra.

Flustra membranaceo-truncata, Smitt.

Smitt (24, III), pp. 358, 376; Pl. XX, figs. 1—5.

Occurrence. St. 262, 223 (Jan Mayen).

This *Flustra* was found in many places in the arctic zone from Novaja Semlja to Greenland. Hincks (9) also mentions it from the Queen Charlotte Islands. It is new to Jan Mayen (St. 223). Judging from its occurrence, this form must be characterised as a true arctic *Flustra*; it has, for instance, not been observed on the shores of Great Britain, nor has it been found in Iceland.

Flustra carbacea, Ell. & Sol.

Flustra papyrea, Smitt (34, III), pp. 359, 380; Pl. XX, figs. 9—11.

Flustra carbacea, Hincks (8), p. 123; Pl. XVI, figs. 4, 4a; Pl. XIV, fig. I.

Occurrence. Kjosen (10—14 fathoms).

This species also has a wide arctic distribution, and is moreover found on the shores of Great Britain and Denmark.

Flustra abyssicola, M. Sars.

G. O. Sars (21), p. 19; Pl. II, figs. 25—30.

Occurrence. St. 149 (Vestfjorden), 260 (Porsangerfjord), 290, 323, 363.

Since G. O. Sars found this peculiar deep-water *Flustra* at the Guldbrand Islands and Skraaven (Vestfjorden), it has been found in the Gulf of St. Lawrence (Whiteaves) and in the Kara Sea (Smitt).

The greatest depth from which this species was brought up during the North Atlantic Expedition was 475 metres (Station 363, clay bottom, temp. 1.1° C.), and the smallest, 247 m. (St. 149, clay bottom, temp. 4.9° C.). The primitive form of the avicularia, the rigid character of the colony, and its occurrence at great depths, indicate that *F. abyssicola* is one of the oldest among the northern representatives of the genus *Flustra* now in existence.

Fam. Membraniporidae.

Gen. Membranipora.

Membranipora cornigera, Busk.

Membranipora flemingii f. *cornigera*, Smitt (24, III), p. 367, tab. 24, fig. 1.

Membranipora cornigera, Hincks (8), p. 164, tab. 21, fig. 4; tab. 22, fig. 3.

Findested. St. 290.

Hincks (8, p. 165) angiver kun tre findesteder for denne art, nemlig Shetland, Outer Haaf, off the coast of Norway. Heraf fremgaar, at arten er yderst sparsom i sin forekomst. Ved de gaffeldelte pigger i munden er den saa let kjendelig, at overseen og forveksling ikke godt kan finde sted.

Membranipora arctica, D'Orb.

Membranipora lineata f. *sophiae*, Smitt (24, III), p. 365, tab. 20, fig. 24, 25.

Membranipora arctica, Lorenz (16), p. 85, tab. 1, fig. 1.

Findested. Norskøerne (Spitsbergen).

Arten dannede et sortagtig overdrag paa snegleskal.

Membranipora spitsbergensis, Smitt.

Semiflustrella arctica, D'Orb. (manuscript).

Membranipora arctica, Smitt (24, III), p. 367, 413, tab. 20, fig. 33—36.

Membranipora spitsbergensis, Bidentkap (1), p. 619.

Findested. Norskøerne.

Denne form, som let kjendes ved sin karakteristiske bagside (Smitt, l. c., fig. 34) er hidtil kun funden ved Spitsbergen. *Membranipora arctica* har jeg taget paa forskjellige steder i Finmarken, men den er ikke observeret saa langt syd som ved Storbritanniens kyster.

Fam. Membraniporidae.

Gen. Membranipora.

Membranipora cornigera, Busk.

Membranipora flemingii f. *cornigera*, Smitt (24, III), p. 367 Pl. XXIV, fig. 1.

Membranipora cornigera, Hincks (8), p. 164; Pl. XXI, fig. 4; Pl. XXII, fig. 3.

Occurrence. Station 290.

Hincks (8, p. 165) mentions only three places where this species has been found, viz. Shetland Isles, Outer Haaf, and off the coast of Norway. From this it appears that the species is of extremely rare occurrence. It is so easily recognisable by the forked spines at the mouth, that it could not well be overlooked or mistaken.

Membranipora arctica, D'Orb.

Membranipora lineata, f. *sophiae*, Smitt (24, III), p. 365; Pl. XX, figs. 24, 25.

Membranipora arctica, Lorenz (16), p. 85; Pl. I, fig. 1.

Occurrence. Norwegian islands (Spitsbergen).

This species formed a blackish coating upon snail-shells.

Membranipora spitsbergensis, Smitt

Semiflustrella arctica, D'Orb. (manuscript).

Membranipora arctica, Smitt (24, III), pp. 367, 413; Pl. XX, figs. 33—36.

Membranipora spitsbergensis, Bidentkap (1), p. 619.

Occurrence. Norwegian islands.

This form, which is easily recognised by its characteristic back (Smitt, l. c., fig. 34), has hitherto been found only at Spitsbergen. I have found *Membranipora arctica* in several places in Finmark, but it has not been observed as far south as the shores of Great Britain.

Fam. Cribrilinidae.

Gen. Cribrilina.

Cribrilina punctata, Hassal.

Escharipora punctata, Smitt (24, IV), p. 4, 51, tab. 24, fig. 4—7.

Cribrilina punctata, Hincks (8), p. 190, tab. 26, fig. 1—4; tab. 24, fig. 3.

Findesteder. St. 315, 323.

Arten forekommer fra Karahavet til det sydvestlige Frankrig. Jeg har taget denne tilligemed den nærstaaende *C. annulata*, Fabr. paa forskellige steder langs den norske kyst.

Fam. Porinidae.

Gen. Tassarodoma.

Tassarodoma gracile, M. Sars.

Anarthropora borealis, Smitt (24, IV), p. 8, 67, tab. 24, fig. 25—29.

Porina borealis, Hincks (8), p. 229, tab. 31, fig. 4—6.

Findesteder. Korsfjorden, St. 10, 290, 312.

Udbredt fra Spitsbergen til Portugal, Florida og Azorerne.

Fam. Celleporellidae.

Gen. Celleporella.

Celleporella hyalina, Linn.

Mollia hyalina, Smitt (24, IV), p. 16, 109, tab. 25, fig. 84—85.

Schizoporella hyalina, Hincks (8), p. 271, tab. 18, fig. 8—10.

Findesteder. Norskøerne (paa gastropoder), St. 366 (paa alger).

Denne art er meget udbredt i arktiske farvand, og den strækker sig ogsaa langt mod syd, forekommer saaledes ved Australien, Sydafrika, Strait of Magellan, Kalifornien, etc. Den er saaledes i sin optræden en ren kosmopolit.

Fam. Cribrilinidae.

Gen. Cribrilina.

Cribrilina punctata, Hassal.

Escharipora punctata, Smitt (24, IV), pp. 4, 51; Pl. XXIV, figs. 4—7.

Cribrilina punctata, Hincks (8), p. 190; Pl. XXVI, figs. 1—4; Pl. XXIV, fig. 3.

Occurrence. St. 315, 323.

This species occurs from the Kara Sea to the south-west of France. I have found it together with the nearly-allied *C. annulata*, Fabr. in various places along the coast of Norway.

Fam. Porinidae.

Gen. Tassarodoma.

Tassarodoma gracile, M. Sars.

Anarthropora borealis, Smitt (24, IV), pp. 8, 67; Pl. XXIV, figs. 25—29.

Porina borealis, Hincks (8), p. 229; Pl. XXXI, figs. 4—6.

Occurrence. Korsfjorden, St. 10, 299, 312.

Extends from Spitsbergen to Portugal, Florida and the Azores.

Fam. Celleporellidae.

Gen. Celleporella.

Celleporella hyalina, Linn.

Mollia hyalina, Smitt (24, IV), pp. 16, 109; Pl. XXV, figs. 84, 85.

Schizoporella hyalina, Hincks (8), p. 271; Pl. XVIII, figs. 8—10.

Occurrence. Norwegian islands (on gastropods), St. 366 (on algæ).

This species is widely distributed in arctic seas, and it also extends far south, occurring in Australia, South Africa, Straits of Magellan, California, etc. It is thus quite a cosmopolitan in its occurrences.

Fam. Myriozoidae.

Gen. Schizoporella.

Schizoporella unicornis, Johnst. forma **ansata**, Hincks.

Mollia vulgaris forma **ansata**, Smitt (24, IV), p. 15, tab. 25, fig. 80.

Schizoporella unicornis f. **ansata**, Hincks (8), p. 239, tab. 35, fig. 3.

Findested. St. 312 (paa *Myriozoum coarctatum*).

Nævnte varietet er tagen paa forskjellige steder ved Storbritaniens kyster samt af Lovén ved Hammerfest, hvor ogsaa jeg i 1894 fandt den ganske hyppig paa stene. Den er endvidere funden ved Grønland.

Gen. Myriozoum.

Myriozoum crustaceum, Smitt.

Smitt (24, IV), p. 18, 114, tab. 25, fig. 88—91.

Schizoporella crustacea, Lorenz (16), p. 87, tab. 7, fig. 2.

Findested Norskøerne (Spitsbergen).

Denne høiarktiske form (Matotschkin scharr, Karahavet, halvøen Kola, Spitsbergen, Jan Mayen, Grønland) er funden i Finmarken. Jeg tog den i 1894 ved Sværholt.

Myriozoum coarctatum, M. Sars.

Tab. I, fig. 1.

Smitt (24, IV), p. 18, 119, tab. 25, fig. 92.

Findesteder. St. 270, 290, 223, 315, 323.

Denne art er ogsaa udpræget arktisk. I Finmarken er den paa sine steder temmelig almindelig, og jeg tog den vinteren 1899 saa langt syd som i Moskenstrømmen, hvilket er det sydligste sted ved den norske kyst, hvor arten har været observeret i dette aarhundrede.

Fam. Escharidae.

Gen. Porella.

Porella laevis, Flem.

Smitt (24, IV), p. 21, 134, tab. 26, fig. 120—123.

Hincks (8), p. 334, tab. 47, fig. 10—11.

Findested. St. 18.

Forekommer langs hele den norske vestkyst til Finmarken. Den er ogsaa tagen ved Shetland, Grønland, Spitsbergen, Novaja Semlja, i Karahavet, etc.

Fam. Myriozoidæ.

Gen. Schizoporella.

Schizoporella unicornis, Johnst. forma **ansata**, Hincks.

Mollia vulgaris forma **ansata**, Smitt (24, IV), p. 15; Pl. XXV, fig. 80.

Schizoporella unicornis f. **ansata**, Hincks (8), p. 239: Pl. XXXV, fig. 3.

Occurrence. St. 312 (on *Myriozoum coarctatum*).

The above variety has been found in several localities on the shores of Great Britain, and by Lovén at Hammerfest, where I also frequently found it in 1894, on stones. It has moreover been found in Greenland.

Gen. Myriozoum.

Myriozoum crustaceum, Smitt.

Smitt (24, IV), pp. 18, 114; Pl. XXV, figs. 88—91.

Schizoporella crustacea, Lorenz (16), p. 87; Pl. VII, fig. 2.

Occurrence. Norwegian islands (Spitsbergen).

This high arctic form (Matotschkin Scharr, the Kara Sea, the Kola Peninsula, Spitsbergen, Jan Mayen, Greenland) is also found in Finmark. I found it, in 1894, at Sværholt.

Myriozoum coarctatum, M. Sars.

Pl I, fig. 1.

Smitt (24, IV), pp. 18, 119; Pl. XXV, fig. 92.

Occurrence. St. 270, 290, 223, 315, 323.

This species is also emphatically arctic. It is rather common in some places in Finmark, and I found it in the beginning of 1899 as far south as Moskenstrømmen, which is the most southerly spot on the Norwegian coast where the species has been observed in the nineteenth century.

Fam. Escharidæ.

Gen. Porella.

Porella lævis, Flem.

Smitt (24, IV), pp. 21, 134; Pl. XXVI, figs. 120—123.

Hincks (8), p. 334; Pl. XLVII, figs. 10, 11.

Occurrence. Station 18.

Occurs all along the Norwegian coast up to Finmark. It has also been found off the Shetland Isles, Greenland, Spitsbergen, Novaja Semlja, in the Kara Sea, etc.

Porella elegantula, D'Orb.

Eschara elegantula, Smitt (24, IV), p. 24, 154, tab. 26, fig. 140—146.

Porella elegantula, Bidekap (1), p. 627, tab. 25, fig. 7, 8

Findesteder. St. 270, 223 (Jan Mayen).

Fra Jan Mayen har Lorenz (16, p. 89, 90) opført 4 arter af slægten *Porella*, nemlig *concinna*, *acutirostris*, *compressa* og *laevis*. Hertil blir nu ogsaa at føie *elegantula*.

Gen. Escharoides.**Escharoides sarsii**, Smitt.

Smitt (24, IV), p. 24, 158, tab. 26, fig. 147—154.

Findesteder. Norskørerne, St. 270.

Arten er ren arktisk. Fra Tromsøsundet har jeg seet eksemplarer, som havde en lignende vekstform som *Lepralia foliacea* fra Englands kyst (f. eks. Plymouth sound), idet kolonierne dannede pladeformigt udbredte og sammenvoksede kavernøse masser. Se forøvrigt M. Sars (23, p. 141—144).

Gen. Smittia.**Smittia palmata**, M. Sars.

? *Flustra solida*, Stimpson, Invertebrata of Grand Manan.

" " Nordgaard (18), p. 15.

Eschara palmata, M. Sars (23), p. 146.

" " Vigelius (31), p. 15, fig. 2, 3.

Escharella palmata, Smitt (24, IV), p. 10, 77, tab. 24, fig. 42—46.

" " Smitt (26), p. 21.

" " Smitt (27), p. 29.

" " Lorenz (16), p. 91.

" " Stuxberg (29), p. 112.

" " Levinsen (15), p. 14, tab. 27, fig. 3.

Pseudo-flustra solida, Bidekap (1), p. 618.

Findesteder. St. 18, 31, 48, 223, 251, 262, 267, 290, 326, 337, 363.

I min fortegnelse over norske polyzoer opførte jeg Sars's *Eschara palmata* som *Flustra solida*, Stimpson. Jeg havde dengang ikke seet noget eksemplar af arten, og henholdt mig til Jelleys katalog. Imidlertid behøver man ikke at se længe paa den forat finde ud, at den ikke godt kan henføres til slægten *Flustra*, og Bidekap (1), oprettede saaledes en ny slekt (*Pseudo-flustra*), hvor arten blev anbragt. Dette kunde visselig forsvares, men jeg har her foretrukket at opføre den som en *Smittia*, da aviculariets

Porella elegantula, D'Orb.

Eschara elegantula, Smitt (24, IV), pp. 24, 154; Pl. XXVI, figs. 140—146.

Porella elegantula, Bidekap (1), p. 627; Pl. XXV, figs. 7, 8.

Occurrence. St. 270, 223 (Jan Mayen).

Lorenz (16, pp. 89, 90) has established 4 species of the genus *Porella* from Jan Mayen, viz. *concinna*, *acutirostris*, *compressa* and *laevis*. To these must now also be added *elegantula*.

Gen. Escharoides.**Escharoides sarsii**, Smitt.

Smitt (24, IV), pp. 24, 158; Pl. XXVI, figs. 147—154.

Occurrence. Norwegian islands, Station 270.

The species is purely arctic. I have seen specimens from Tromsø Sound, that had a form of growth similar to that of *Lepralia foliacea* from the English coast (e. g. Plymouth Sound), as the colonies form lamellarly expanded and aggregated cavernous masses. See also M. Sars (23, pp. 141—144).

Gen. Smittia.**Smittia palmata**, M. Sars.

? *Flustra solida*, Stimpson, Invertebrata of Grand Manan.

" " Nordgaard (18), p. 15.

Eschara palmata, M. Sars (23), p. 146.

" " Vigelius (31), p. 15, figs. 2, 3.

Escharella palmata, Smitt (24, IV), pp. 10, 77; Pl. XXIV, figs. 42—46.

" " Smitt (26), p. 21.

" " Smitt (27), p. 29.

" " Lorenz (16), p. 91.

" " Stuxberg (29), p. 112.

" " Levinsen (15), p. 14; Pl. XXVII, fig. 3.

Pseudo-flustra solida, Bidekap (1), p. 618.

Occurrence. St. 18, 31, 48, 223, 251, 262, 267, 290, 326, 337, 363.

In my list of Norwegian polyzoans, I entered Sars's *Eschara palmata* as *Flustra solida*, Stimpson. I had not at that time seen any specimens of the species, and had followed Jelley's catalogue. It need not be looked at long, however, to see that it cannot well be referred to the genus *Flustra*, and Bidekap (1) therefore established a new genus (*Pseudo-flustra*), in which the species was placed. This may be quite justifiable, but I have preferred to enter it as a *Smittia*, as the position and structure of the avi-

stilling eg bygning peger mod nært slektskab. Ældre zoócier viser tildels temmelig stor lighed med zoócierne hos *Smittia reticulata*. Da jeg for tiden ikke kan afgjøre, om Stimpson og Sars's arter er identiske, har jeg opført Sars's navn *palmata*.

I sin beskrivelse gjorde M. Sars opmærksom paa de bøielige rør af kitinagtig beskaffenhed, som var fæstede til zoariet.

Smitt (24, IV, p. 80), paapegede, at disse rør eller rodtraade (tubular fibres) udgik fra selve zoócierne og at de nærmede sig hinanden og tilslut voksede sammen til et knippe mod koloniens proximale ende. Ved hjælp af dette knippe var kolonierne fæstede til fremmede legemer paa bunden, saasom ormrør og lignende. Vigelius (31, p. 16) skriver: „They (the branches of the colony) are connected by numerous tubular fibres, originating on both sides of the zoarium from membranous rather pear-shaped envelopes, which cover certain zoöcia (fig. 2)“. Disse tuber danner mærkelig nok et slags forlængelse nedad af zoócierne, og deres betydning for koloniens liv, maa uden tvivl være at fungere som et støtteapparat, som holder det skjøre zoarium sammen, selv om det brækkes af paa forskellige steder.

Smittia reticulata, Mac Gill.

Escharella legentilii, Smitt (24, IV), p. 10, 81, tab. 24, fig. 47—52.

Smittia reticulata, Hincks (8), p. 346, tab. 48, fig. 1—5.

Findested. St. 290.

Arten er funden i Karahavet (Levinsen), ved Novaja Semlja (Smitt), Jan Mayen (Lorenz) og opføres ogsaa for Grønland. Men den er ingen arkticus i streng forstand, den forekommer saaledes ved Englands og Frankrigs kyster, i Adriaterhavet, ja endog ved Nyzealand og Falklands-øerne.

Smittia trispinosa, Johnst.

Tab. I, fig. 9.

Escharella jacotini, Smitt (24, IV), p. 11, 86, tab. 24, fig. 53—57.

Smittia trispinosa, Hincks (8), p. 353, tab. 49, fig. 1—8.
 „ „ var. *arborea*, Levinsen (15), p. 16, tab. 27, fig. 7, 8.

Findesteder. St. 273, 326, 357.

Paa de nævnte steder forekom kun den af Levinsen opstillede eiendommelige form *arborea*. Denne varietet er tagen foruden af Dimphna- og Nordhavsekspeditionen ogsaa af Kückenthal og Walter ved Spitsbergen (Bidenkap). Jeg tog den vinteren 1899 i Porsangerfjorden, hvormed den

cularia indicate a close relationship. Older zoöcia sometimes bear considerable resemblance to the zoöcia in *Smittia reticulata*. As I cannot at present decide whether Stimpson's and Sars's species are identical, I have put down Sars's name, *palmata*.

M. Sars, in his description, drew attention to the flexible tubes of a chitinous consistency, that were attached to the zoarium.

Smitt (24, IV, p. 80) pointed out that these tubes or root-fibres (tubular fibres) issued from the zoöcia themselves, and that they approached one another, and at last grew together into a bunch towards the proximal end of the colony. By means of this bunch, the colonies were attached to foreign bodies at the bottom, such as worm-casts, and the like. Vigelius (31, p. 16) writes: „They [the branches of the colony] are connected by numerous tubular fibres, originating on both sides of the zoarium from membranous, rather pear-shaped envelopes, which cover certain zoöcia (fig. 2)“. These tubes, strange to say, form a kind of prolongation downwards of the zoöcia, and their significance to the existence of the colony must without doubt be to act as a support to keep the brittle zoarium together, even if it be broken in several places.

Smittia reticulata, MacGill.

Escharella legentilii, Smitt (24, IV), pp. 10, 81; Pl. XXIV, figs. 47—52.

Smittia reticulata, Hincks (8), p. 346; Pl. XLVIII, figs. 1—5.

Occurrence. Station 290.

The species has been found in the Kara Sea (Levinsen), at Novaja Semlja (Smitt), Jan Mayen (Lorenz), and is also recorded from Greenland. But it is not strictly speaking an arctic species, as it occurs on the coasts of England and France, in the Adriatic, and even off New Zealand and the Falkland Isles.

Smittia trispinosa, Johnst.

Pl. I, fig. 9.

Escharella jacotini, Smitt (24, IV), pp. 11, 86; Pl. XXIV, figs. 53—57.

Smittia trispinosa, Hincks (8), p. 353; Pl. XLIX, figs. 1—8.
 „ „ var. *arborea*, Levinsen (15), p. 16; Pl. XXVII, figs. 7, 8.

Occurrence. St. 273, 326, 357.

Levinsen's peculiar form *arborea* was the only one that occurred at the above places. This variety has not only been found by the Dimphna and North Atlantic Expeditions, but also by Kückenthal and Walter at Spitsbergen (Bidenkap). I found it in the early part of 1899

ogsaa kan indlemmes i Norges fauna. I den mudderfuldte hulhed af kolonierne fra St. 357 havde annelider og gephyreer tildels taget bolig.

Gen. **Mucronella**.

Mucronella abyssicola, Norman.

Hincks (8), p. 369, tab. 38, fig. 1—2.

Findesteder. St. 48 (paa *retepora*), 223 (paa *myriozoum*), 225, 273.

Mucronella labiata, Boeck.

Discopora coccinea forma *labiata*, Smitt (24, IV), p. 27, 175, tab. 27, fig. 176.

Findesteder. St. 270, 290, 315.

Denne art forekommer svært ofte fastvokset til *Hornera lichenoides*.

Begge de sidstnævnte er fundne paa flere steder ved Norgest kyst, *abyssicola* er tagen ved Jan Mayen (Lorenz), og *labiata* opføres fra Kola og Novaja Semlja (Smitt).

Mucronella coccinea, Abildg.

Discopora appensa, Smitt (24, IV), p. 27, 175, tab. 27, fig. 177.

Mucronella coccinea, Hincks (8), p. 371, tab. 34, fig. 1—6.

Findested. St. 290.

Udbredt fra Novaja Semlja til Grønland og fra Spitsbergen til England, Frankrig og Adriaterhavet.

Mucronella sincera, Smitt.

Tab. I, fig. 13—15.

Discopora sincera, Smitt (24, IV), p. 28, 177, tab. 27, fig. 178—180.

" " Smitt (26), p. 23.

" " Smitt (27), p. 30.

Lepralia sincera, Hincks (10), p. 102, tab. 11, fig. 2.

" " Lorenz (16), p. 88.

" " Hennig (7), p. 357.

Hemieschara sincera, Busk (*), p. 237.

? *Mucronella praelucida*, Hincks (9), p. 26, tab. 4, fig. 1.

" " Hincks (11), p. 225, tab. 15, fig. 3.

Mucronella sincera, Nordgaard (18, I), p. 29, tab. 1, fig. 6.

" " Bidentkap (1), p. 625.

Findesteder. St. 275, 223, 357.

*) Journ. Linnean Soc., Zool., vol. 15.

in Porsanger Fjord, which gives it a place among the fauna of Norway. The mud-filled cavities of the colonies from Station 357, were partly inhabited by annelids and gephyreans.

Gen. **Mucronella**.

Mucronella abyssicola, Norman.

Hincks (8), p. 369; Pl. XXXVIII, figs. 1, 2.

Occurrence. St. 48 (on *Retepora*), 223 (on *Myriozoum*), 225, 273.

Mucronella labiata, Boeck.

Discopora coccinea forma *labiata*, Smitt (24, IV), pp. 27, 175; Pl. XXVII, fig. 176.

Occurrence. St. 270, 290, 315.

This species occurs very frequently growing upon *Hornera lichenoides*.

Both the last-named species are found in several places on the coast of Norway. *Abyssicola* has been found at Jan Mayen (Lorenz), and *labiata* is recorded from the Kola Peninsula and Novaja Semlja (Smitt).

Mucronella coccinea, Abildg.

Discopora appensa, Smitt (24, IV), pp. 27, 175; Pl. XXVII, fig. 177.

Mucronella coccinea, Hincks (8), p. 371; Pl. XXXIV, figs. 1—6.

Occurrence. Station 290.

Distributed from Novaja Semlja to Greenland, and from Spitsbergen to England, France and the Adriatic.

Mucronella sincera, Smitt.

Pl. I, figs. 13—15.

Discopora sincera, Smitt (24, IV), pp. 28, 177; Pl. XXVII, figs. 178—180.

" " Smitt (26), p. 23.

" " Smitt (27), p. 30.

Lepralia sincera, Hincks (10), p. 102; Pl. XI, fig. 2.

" " Lorenz (16), p. 88.

" " Hennig (7), p. 357.

Hemieschara sincera, Busk (*), p. 237.

? *Mucronella praelucida*, Hincks (9), p. 26; Pl. IV, fig. 1.

" " Hincks (11), p. 225; Pl. XV, fig. 3.

Mucronella sincera, Nordgaard (18, I), p. 29; Pl. I, fig. 6.

" " Bidentkap (1), p. 625.

Occurrence. Station 275, 223, 357.

*) Journ. Linnean Soc., Zool., Vol. XV.

Ligesom de fleste *mucronella*-arter er ogsaa denne underkastet betydelig variation.

Paa høiarktiske eksemplarer kan zoócierne naa en usædvanlig størrelse. Paa en koloni fra St. 223 har jeg saaledes maalt:

Zoóciets længde	1.2 mm.
„ bredde	0.47 -
Mundingens bredde	0.36 -
Aviculariets længde fra mandibelledet	0.2 -
„ bredde	0.12 -

Lignende maal har jeg taget paa en koloni fra Jøkel-fjord (Kvænangen):

Zoóciets længde	1.0 mm.
„ bredde	0.42 -
Mundingens bredde	0.29 -

Proximalrandens mucro er meget forskjellig i sin udvikling, og munden kan tildels have et *lepralia*-lignende udseende (fig. 15). Zoóciernes væg er i regelen tydelig perforeret. Derimod kan oócierne undertiden give indtryk af at være hele (fig. 13), i andre tilfælde er perforeringen paatagelig (fig. 14). Selv hos kolonier med ganske jevnbrede zoócier har jeg seet tydelige huller i oócierne. Oóciernes form er heller ikke konstant, idet ganske kuglerunde kan veksle med ovale. Avicularierne mangler i regelen, og naar de forekommer sidder et dels paa høire side, dels paa venstre side af munden, eller der kan ogsaa optræde et paa hver side (fig. 14). Mandibelen er but, og avicularierne danner som oftest en ret vinkel med zoóciets længderetning. Hincks (9) har leveret en figur af sin art *Mucronella præluca*, som leder tanken hen paa *sincera*-arten. Af denne sidste har Hincks muligens kun seet *lepralia*-lignende former (se 10, tab. 11, fig. 3), og da var det naturligt at opstille *præluca* som en egen art, men har man seet i hvilken grad *M. sincera* kan variere, bliver man tilbøielig til at opfatte *præluca* som en varietet af denne. „The peculiar projections, placed on each side of the cell“ (Hincks, 11, p. 225) var muligens ikke fuldt udviklede avicularier (se 9, tab. 4, fig. 1), og skulde den formodning være rigtig, faar *præluca* fra Queen Charlotte Islands en paafaldende lighed med *sincera* fra det nordlige ishav. I ethvertfald er *M. sincera* udbredt fra Novaja Semlja til Grønland, og fra Spitsbergen til Lofoten. Paa min reise vinteren 1899 tog jeg nemlig en koloni ved Digermulen i Raftsundet.

Gen. *Palmicellaria*.

Palmicellaria skenei, Ell. et Sol.

Eschara skenei var. *tridens*, Busk (3), p. 33, fig. 3.

Cellepora tridens, Kirchenpauer (Bryozoa, Die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Nordsee im Sommer 1872, p. 188, fig. a, b).

Findesteder. St. 290, 223, 323, 363.

Like most of the *Mucronella* species, this is subject to considerable variation.

In extreme arctic specimens, the zoœcia sometimes attain an unusual size. In one colony, for instance, from Station 223, I have found the following measurements:

Length of zoœcium	1.2 mm.
Breadth of zoœcium	0.48 -
Breadth of aperture	0.36 -
Length of avicularium from mandibular joint	0.2 -
Breadth of avicularium	0.12 -

I have taken similar measurements from a colony from Jøkel Fjord (Kvænangen):

Length of zoœcium	1.0 mm.
Breadth of zoœcium	0.42 -
Breadth of aperture	0.29 -

The mucro of the proximal margin is very varied in its development, and the mouth has sometimes a *Lepralia*-like appearance (fig. 15). The wall of the zoœcia is generally perforated. The oœcia, on the other hand, sometimes give the impression of being entire (fig. 13); in other cases the perforations are evident (fig. 14). Even in colonies with zoœcia of equal breadth, I have seen distinct holes in the oœcia. Nor is the shape of the oœcia constant, as quite spherical sometimes alternate with oval. The avicularia are generally wanting, and when they occur, are situated on the right, or the left of the aperture, or one may appear on each side (fig. 14). The mandible is not tapering, and the avicularia are generally at right angles to the longitudinal axis of the zoœcium. Hincks (9) has given a figure of this species *Mucronella præluca* which recalls the *sincera* species. It is possible that Hincks has only seen forms resembling *Lepralia* (see 10, Pl. II, fig. 3), and it would then be natural to make *præluca* into a special species; but any one who has seen to what an extent *M. sincera* can vary, will be inclined to look upon *præluca* as one of its varieties. „The peculiar projections, placed on each side of the cell“ (Hincks 11, p. 225), were possibly avicularia that were not fully developed (see 9, Pl. IV, fig. 1); and should this supposition be correct, the *præluca* from Queen Charlotte Islands acquires a striking resemblance to the *sincera* from the northern polar sea. In any case, *M. sincera* is distributed from Novaja Semlja to Greenland, and from Spitsbergen to Lofoten. While on my journey in the early part of 1899, I found a colony at Digermulen in Raftsundet.

Gen. *Palmicellaria*.

Palmicellaria skenei, Ell. & Sol.

Eschara skenei var. *tridens*, Busk (3), p. 33, fig. 3.

Cellepora tridens, Kirchenpauer (Bryozoa, Die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Nordsee im Sommer 1872, p. 188, figs. a, b).

Occurrence. St. 290, 223, 323, 363.

Paa samtlige steder var det Busks varietet, som optraadte. Kirchenpauers beskrivelse er baseret paa et eksemplar taget SV for Bukkenfjordens munding. I min fortegnelse (18, I, p. 26) har jeg opført denne art under navnet *porella skenei*, og de eksemplarer, jeg da havde for mig, lignede nærmest Hincks varietet *bicornis* (8, p. 380, tab. 52, fig. 4).

Fam. Celleporidae.

Gen. Rhamphostomella.

Rhamphostomella costata, Lorenz.

Lorenz (16), p. 94, tab. 7, fig. 11.

Findesteder. St. 262, 273.

Arten er desuden omtalt fra St. Lawrence af Hincks (11, p. 426, tab. 21, fig. 6—8), og er funden af mig i Mehavn i Finmarken. Den er rimeligvis ikke saa sparsom i sin forekomst som man efter dette skulde tro, da den uidentvil af enkelte forfattere har været slaaet sammen med *Rhamphostomella (Cellepora) scabra*.

Gen. Cellepora.

Cellepora ramulosa, Linn.

Hincks (8), p. 401, tab. 52, fig. 7—9.

Findested. Korsfjorden, 53 favne.

Er tagen hist og her efter Skandinaviens kyst fra Bohuslän til Finmarken.

Cellepora incrassata, Lamarck.

Celleporaria incrassata, Smitt (24, IV), p. 33, 198, tab. 28, fig. 212, 213.

Cellepora cervicornis, Lorenz (16), p. 95, tab. 1, fig. 12.

Cellepora ventricosa, Lorenz (16), p. 96, tab. 1, fig. 13.

Findesteder. St. 270, Norskøerne (Spitsbergen).

Arten har stor udbredelse i arktiske have, men gaar ikke saa langt mod syd som til Storbritanien.

In all these places it was Busk's variety that appeared. Kirchenpauer's description is based upon a specimen taken at the SW of the mouth of the Bukken Fjord. In my list (18, I, p. 26), I have entered this species under the name of *Porella skenei*; and the specimens I then had before me, most resembled Hinck's variety *bicornis* (8, p. 380; Pl. LII, fig. 4).

Fam. Celleporidæ.

Gen. Rhamphostomella.

Rhamphostomella costata, Lorenz.

Lorenz (16), p. 94; Pl. VII, fig. 11.

Occurrence. St. 262, 273.

This species is also mentioned from St. Lawrence by Hincks (11, p. 426; Pl. XXI, figs. 6—8), and has been found by me at Mehavn in Finmark. It is probably not so uncommon in its occurrence as this would lead one to believe, as there is no doubt that it has been classed by some authors with *Rhamphostomella (Cellepora) scabra*.

Gen. Cellepora.

Cellepora ramulosa, Linn.

Hincks (8), p. 401; Pl. LII, figs. 7—9.

Occurrence. Korsfjord, 53 fathoms.

Is found here and there along the Scandinavian coast from Bohuslän to Finmark.

Cellepora incrassata, Lamarck.

Celleporaria incrassata, Smitt (24, IV), pp. 33, 198; Pl. XXVIII, figs. 212, 213.

Cellepora cervicornis, Lorenz (16), p. 95; Pl. I, fig. 12.

Cellepora ventricosa, Lorenz (16), p. 96; Pl. I, fig. 13.

Occurrence. St. 270, Norwegian islands (Spitsbergen).

The species is widely distributed in arctic waters, but does not extend so far south as Great Britain.

Cyclostomata.

Fam. Crisidae.

Gen. Crisia.

Crisia eburnea, Linn.

Crisia eburnea, Smitt (24, I) p. 117, 132, tab. 16, fig. 7—19.

" " Hincks (8), p. 420, tab. 56, fig. 5, 6.

Crisia cornuta, Smitt (24, I), p. 116, tab. 16, fig. 1.

" " Hincks (8), p. 419, tab. 56, fig. 1—4.

Findesteder. St. 31, Brandø Sund.

I tilslutning til Hincks har jeg i min fortegnelse (18, II) opført formerne *eburnea* og *cornuta* som særskilte arter. Da der imidlertid mellem de to eksisterer overgangsformer, er det kanske rigtigst at benytte *eburnea* som artsnavn og opføre den anden som *forma cornuta*.

Crisia denticulata, Lamarek.

Smitt (24, I), p. 117, 137, tab. 16, fig. 20 a, b).

Hincks (8), p. 422, tab. 56, fig. 7—9.

Findesteder. St. 10, 164, 223, 262, 273, 323, Porsangerfjord, Spitsbergen.

Denne *crisia* har ogsaa udenfor de arktiske farvand en stor udbredelse.

Cyclostomata.

Fam. Crisidæ.

Gen. Crisia.

Crisia eburnea, Linn.

Crisia eburnea, Smitt (24, I), pp. 117, 132; Pl. XVI, figs. 7—19.

" " Hincks (8), p. 420; Pl. LVI, figs. 5, 6.

Crisia cornuta, Smitt (24, I), p. 116; Pl. XVI, fig. 1.

" " Hincks (8), p. 419; Pl. LVI, figs. 1—4.

Occurrence. Station 31, Brandø Sund.

In my list (18, II), I have followed Hincks in entering the forms *eburnea* and *cornuta* as separate species. As transition forms exist, however, between the two, it will perhaps be best to employ *eburnea* as the specific name, and designate the other as *forma cornuta*.

Crisia denticulata, Lamarek.

Smitt (24, I), pp. 117, 137; Pl. XVI, fig. 20 a, b).

Hincks (8), p. 422; Pl. LVI, figs. 7—9.

Occurrence. St. 10, 164, 223, 262, 273, 323, Porsanger Fjord, Spitsbergen.

This *Crisia* is also widely distributed outside the arctic seas.

Fam. **Tubuliporidae.**Gen. **Tubulipora.****Tubulipora flabellaris**, Fabr.

Smitt (24, II), p. 401, 455, tab. 9, fig. 6—8.

Harmer (6), p. 99, tab. 8, fig. 4.

Findested. St. 366.

Arten er vistnok væsentlig arktisk, men dens udbredelse kan ikke sikkert angives, da den har været forvekslet med andre *tubuliporida*. Se herom Harmer (6).

Gen. **Idmonea.****Idmonea atlantica**, Forbes.

Tubulipora atlantica, Smitt (24, II), p. 398, tab. 3, fig. 6—7, tab. 4, fig. 4—13.

Idmonea atlantica, Hincks (8), p. 451, tab. 65, fig. 1—4.**Findesteder.** St. 223, 273, 286, 290, 323, 363.

Er særlig arktisk i sin forekomst, men er ogsaa ifølge Hincks tagen ved Neapel, Florida, Madeira. Jeg har taget arten paa forskellige steder langs den norske kyst fra Bergen til Finmarken, men har ingensteds fundet den i saa store masser som udenfor Nordkap.

Gen. **Entalophora.****Entalophora deflexa**, Smitt.

Tab. I, fig. 10, 11.

Entalophora deflexa, Smitt (28), p. 11, tab. 5, fig. 28—30.

Pustulopora deflexa, Busk, Report on the Polyzoa collected by H. M. S. Challenger, Part 2, p. 20, tab. 4, fig. 3.

Findesteder. St. 223, 273, 323, 363.

Smitt (26) har fra Karahavet nævnt en *entalophora*, som blev identificeret med Couch's art *tubulipora deflexa*, hvilken forøvrigt af Hincks er opført som en *stomatopora* (8, p. 437, tab. 57, fig. 4).

Levinsen (15) opfører ogsaa fra Karahavet en *entalophora*, men denne blev tydet som *entalophora clavata*, Busk med henvisning til Hincks (8, p. 456).

Samme art er ogsaa af Lorenz (16) angivet som forekommende ved Jan Mayen.

De kolonier, som Nordhavsexpeditionen hjembragte, kan jeg imidlertid ikke faa til at passe med nogen af de nævnte former. Derimod stemmer dens udseende temmelig godt med Smitts beskrivelse og tegninger af *entalophora*

Fam. **Tubuliporidae.**Gen. **Tubulipora.****Tubulipora flabellaris**, Fabr.

Smitt (24, II), pp. 401, 455; Pl. IX, figs. 6—8.

Harmer (6), p. 99; Pl. VIII, fig. 4.

Occurrence. Station 366.

This species, it is true, is principally arctic, but its distribution cannot be certainly stated, as it has been confounded with other *Tubuliporidae*. Vide Harmer (6) on the subject.

Gen. **Idmonea.****Idmonea atlantica**, Forbes.

Tubulipora atlantica, Smitt (24, II), p. 398; Pl. III, figs. 6, 7; Pl. IV, figs. 4—13.

Idmonea atlantica, Hincks (8), p. 451; Pl. LXV, figs. 1—4.**Occurrence.** St. 223, 273, 286, 290, 323, 363.

Is especially arctic in its occurrence, but according to Hincks, is also found at Naples, and in Florida and Madeira. I have taken the species in various places along the Norwegian coast from Bergen to Finmark, but have found it nowhere in such great numbers as off the North Cape.

Gen. **Entalophora.****Entalophora deflexa**, Smitt.

Pl. I, figs. 10, 11.

Entalophora deflexa, Smitt (28), p. 11; Pl. V, figs. 28—30.

Pustulopora deflexa, Busk, Report on the Polyzoa collected by H. M. S. Challenger, Part II, p. 20; Pl. IV, fig. 3.

Occurrence. St. 223, 273, 323, 363.

Smitt (26) mentions an *Entalophora* from the Kara Sea, which was identified with Couch's species *Tubulipora deflexa*, which, moreover, is classed by Hincks as a *Stomatopora* (8, p. 437; Pl. LVII, fig. 4).

Levinsen (15) also gives an *Entalophora* from the Kara Sea, but this is designated *Entalophora clavata*, Busk, with a reference to Hincks (8, p. 456).

The same species is also mentioned by Lorenz (16) as occurring off Jan Mayen.

I cannot, however, make the colonies brought home by the North Atlantic Expedition agree with any of the above-mentioned forms. On the other hand, their appearance agrees fairly well with Smitt's description and draw-

deflexa i Floridan Bryozoa, og jeg maa antage, at det virkelig er denne art, som har foreligget. Enhver, som har beskæftiget sig noget med cyclostomate polyzoer, ved hvilke store vanskeligheder ofte er forbundet med at identificere dem, og man tør neppe stole sikkert paa, at den arktiske fauna omfatter baade *entalophora deflexa* og *clavata* samt desuden *stomatopora deflexa*, Couch.

Det, som især synes at karakterisere *entalophora deflexa*, er den betydelige længde af zoóciernes frie del, jeg har nemlig fundet den af være 0.84—0.96 mm., stundom endog 1.2 mm. Længden er nemlig ogsaa underkastet betydelig variation. Zoóciernes tykkelse i den frie del fandtes at variere mellem 0.14—0.18 mm.

Oócier har jeg ikke fundet, men Smitt har tegnet dem som en opsvulmning under bifurcationen.

Gen. *Reticulipora*.

Reticulipora intricaria, Smitt.

Tab. I, fig. 12.

Reticulipora intricaria, Smitt (24, V), p. 1117, tab. 20, fig. 1—3.

Diastopora intricaria, Levinsen (15), p. 21.

Reticulipora intricaria, Nordgaard (18, II), p. 5.

Findesteder. St. 48, 290, 315.

Af de her opførte Stationer ligger 48 i øst for Island, 290 og 315 mellem Norge og Spitsbergen. Paa dette strøg er arten tagen engang før, nemlig af den svenske Spitsbergexpedition (Smitt). Lindahl har taget den i Baffins Bay, og Dijnphnaexpeditionen i Karahavet (Levinsen). Endelig har jeg fundet den ved Sværholt i Finmarken.

Smitt (l. c.) har tydelig fremhævet slægtskabet med *diastopora* specielt *obelia* ved tilstedeværelsen af smaarør, tilslutning af de ældre zoécier ved en kalklamel, o. s. v. Denne kalklamel (operculum) er ogsaa her perforeret. De kolonier jeg havde til undersøgelse, afgav nok et vidnesbyrd om nært slægtskab med *diastopora*, idet der i grenenes kant forekom et listeagtigt fremspring svarende til basal-skivens udvidelse hos *diastopora* (the marginal extension of the basal lamina).

Længden af den frie del af zoócierne ved 0.4—0.6 mm. og tykkelsen ca. 0.12 mm.

ings of *Entalophora deflexa* in Floridan Bryozoa; and I may assume that it really is this species that I have had before me. Any one who has had anything to do with cyclostomatous polyzoans, knows the great difficulties that are frequently connected with their identification; and one dare hardly be sure that the arctic fauna includes both *Entalophora deflexa* and *clavata*, as well as *Stomatopora deflexa*, Couch.

That which seems especially to characterise *Entalophora deflexa*, is the considerable length of the free portion of the zoécia. I have found it to be 0.84—0.96 mm., sometimes as much as 1.2 mm. The length, too, is subject to considerable variation. The thickness of the zoécia in their free part was found to vary between 0.14 and 0.18 mm.

I have not found any oécia, but Smitt has drawn them as a swelling below the bifurcation.

Gen. *Reticulipora*.

Reticulipora intricaria, Smitt.

Pl. I, fig. 12.

Reticulipora intricaria, Smitt (24, V), p. 1117; Pl. XX, figs. 1—3.

Diastopora intricaria, Levinsen (15), p. 21.

Reticulipora intricaria, Nordgaard (18, II), p. 5.

Occurrence. St. 48, 290, 315.

Of the above-mentioned stations, 48 lies east of Iceland, and 290 and 315 between Norway and Spitsbergen. The species has been taken once before in this district, namely, by the Swedish Spitsbergen Expedition (Smitt). Lindahl has found it in Baffin's Bay, and the Dijnphna Expedition in the Kara Sea (Levinsen). Lastly, I have found it at Sværholt in Finmark.

Smitt (l. c.) has clearly pointed out the relationship to *Diastopora*, especially *obelia*, in the presence of small tubes, the closing of the older zoécia by a calcareous lamella, etc. This calcareous lamella (operculum) is perforated here too. The colonies I examined possessed yet another proof of their near relationship to *Diastopora*, in the occurrence of a fillet-like projection at the edge of the branches, corresponding to the extension of the basal lamina in *Diastopora*.

The length of the free portion of the zoécia was from 0.4 to 0.6 mm., and its thickness about 0.12.

Fam. Horneridae.

Gen. Hornera.

Hornera lichenoides (Pontopidan), Linn.

Smitt (24, II), p. 404, tab. 7, fig. 1—14.

Hincks (8), p. 468, tab. 67, fig. 1—5.

Findesteder. St. 223, 273, 275, 290, 315, 337.

Paa st. 275 forekom den robuste varietet. Er særlig arktisk, men gaar sydover til Bohuslän, Shetland og Hebriderne.

Fam. Lichenoporidae.

Gen. Lichenopora.

Lichenopora hispida, Flem.*Discoporella hispida*, Smitt (24, II), p. 406, 483, tab. 11, fig. 10—12.*Lichenopora hispida*, Hincks (8), p. 473, tab. 68, fig. 1—8.

Findested. St. 337.

Udbredt fra Norge til Frankrige.

Lichenopora verrucaria, Fabr.*Discoporella verrucaria*, Smitt (24, II), p. 405, 479, tab. 10, fig. 6—8.*Lichenopora verrucaria*, Hincks (8), p. 478, tab. 64, fig. 4—5.

" " Harmer (5), tab. 7, fig. 1—9.

Findested. St. 366 (paa alger).

Udhredt fra Spitsbergen til England og fra Karahavet til Grønland.

Gen. Defrancia.

Defrancia lucernaria, M. Sars.

Tab. I, fig. 16—17.

Tubulipora lucernaria, M. Sars (22), p. 145.*Defrancia lucernaria*, M. Sars (23), g. 164.

" " Smitt (24, II), p. 408, 493.

" *truncata*, Busk (3), p. 35, tab. 1, fig. 8." *lucernaria*, Busk (2, Part 3), p. 36, tab. 33, fig. 3.*Domopora stellata*, Lorenz (16), p. 99." *lucernaria*, Levinsen (15), p. 22 (sep.).

Fam. Horneridæ.

Gen. Hornera.

Hornera lichenoides (Pontopidan), Linn.

Smitt (24, II), p. 404; Pl. VII, figs. 1—14.

Hincks (8), p. 468; Pl. LXVII, figs. 1—5.

Occurrence. St. 223, 273, 275, 290, 315, 337.

The robust variety occurred at Station 275. Is distinctly arctic, but is found southwards as far as Bohuslän, the Shetlands, and the Hebrides.

Fam. Lichenoporidae.

Gen. Lichenopora.

Lichenopora hispida, Flem.*Discoporella hispida*, Smitt (24, II), pp. 406, 483; Pl. XI, figs. 10—12.*Lichenopora hispida*, Hincks (8), p. 473; Pl. LXVIII, figs. 1—8.

Occurrence. Station 337.

Distributed from Norway to France.

Lichenopora verrucaria, Fabr.*Discoporella verrucaria*, Smitt (24, II), pp. 405, 479; Pl. X, figs. 6—8.*Lichenopora verrucaria*, Hincks (8), p. 478; Pl. LXIV, figs. 4, 5.

" " Harmer (5), Pl. VII, figs. 1—9.

Occurrence. Station 366 (on algæ).

Distributed from Spitsbergen to England, and from the Kara Sea to Greenland.

Gen. Defrancia.

Defrancia lucernaria, M. Sars.

Pl. I, figs. 16, 17.

Tubulipora lucernaria, M. Sars (22), p. 145.*Defrancia lucernaria*, M. Sars (23), p. 164.

" " Smitt (24, II), pp. 408, 493.

" *truncata*, Busk (3), p. 35; Pl. I, fig. 8." *lucernaria*, Busk (2, Part 3), p. 36; Pl. XXXIII, fig. 3.*Domopora stellata*, Lorenz (16), p. 99." *lucernaria*, Levinsen (15), p. 22.

Findesteder. St. 267, 290, 323, 357, 363, Porsangerfjorden.

Denne art opdagedes først af M. Sars paa hans reise til Lofoten og Finmarken i 1849. I hans herom afgivne beretning blev den kortelig beskrevet under navnet *tubulipora lucernaria*. Den gjenfandtes ved Finmarken i 1856 af M'Andrew, og Busk identificerede den feilagtig med Jamesons art *domopora truncata*. Senere er arten udføreligere beskrevet af M. Sars (23) og Smitt (24, II).

Lorenz (16, p. 99) opfører *domopora stellata*, Goldfuss fra Jan Mayen, men udtrykket „durch einen besonders dünnen Stiel ausgezeichnet“ vidner om, at det er *defrancia lucernaria*, som har foreligget. (Jan Mayen som findested for *domopora stellata* bør saaledes udgaa).

Defrancia lucernaria har efter dette følgende udbredelse: Karahavet, Kola, Spitsbergen, Grønland (Levinsen, Smitt), Jan Mayen (Lorenz), nordlige Norge (M. Sars). I Norge har Sars taget nævnte art ved Vadsø, i Komagfjord og Øxfjord (Finmarken), ved Beian (Trondhjemsfjorden), samt i Kristianiafjorden et forkrøblet eksemplar. Aurivillius omtaler den fra Kvæningen, og jeg har vinteren 1899 taget den paa forskjellige steder fra Lofoten til Porsangerfjorden. Jeg sætter foreløbig Lofoten som artens sydgrænse ved vor kyst; thi det ene (muligens ogsaa subfossile eksemplar), som M. Sars tog ved Vallø i Kristianiafjorden kan ikke berettigede til at flytte udbredelsesgrænsen did. Ved Beian er den heller ikke gjenfunden siden Sars's dage. Et interessant faktum er det imidlertid, at denne udpræget arktiske form i dette aarhundrede er observeret baade i Trondhjems- og Kristianiafjorden. For at levere et billede af de fysiske forhold, hvorunder *defrancia lucernaria* lever, vil jeg opføre dybde, temperatur og saltgehalt paa endel af de steder, hvor arten observeredes paa min reise vinteren 1899, samt paa Nordhavexpeditionens stationer.

1899	Sted	Dybde	Temp.	Saltgehalt
3die mars	Kirkfjorden (Moskenesø)	50 m.	2.5° C.	33.40 ‰
19de april	Kvæningen	90 -	0.75° -	34.21 -
21de „	Jøkelfjord	90 -	1.4° -	34.35 -
27de „	Porsangerfjord . .	200 -	0.2° -	34.48 -

Occurrence. St. 267, 290, 323, 357, 363, Porsanger Fjord.

This species was first discovered by M. Sars on his journey through Lofoten and Finmark in 1849. In his report, it was briefly described under the name *Tubulipora lucernaria*. It was found again in Finmark, in 1856, by M'Andrew, and Busk identified it erroneously with Jameson's species *Domopora truncata*. The species was subsequently described at greater length by M. Sars (23) and Smitt (24, II).

Lorenz (16, p. 99) records *Domopora stellata*, Goldfuss, from Jan Mayen, but the expression „durch einen besonders dünnen Stiel ausgezeichnet“, shows that it has been *Defrancia lucernaria*. (Jan Mayen ought therefore to be omitted from the list of places where *Domopora stellata* is found).

According to this, *Defrancia lucernaria* has the following distribution: the Kara Sea, the Kola Peninsula, Spitsbergen, Greenland (Levinsen, Smitt), Jan Mayen (Lorenz), the north of Norway (M. Sars). Sars has found the species in Norway, at Vadsø, in the Komagfjord and Ox-fjord (Finmark), at Beian (Trondhjem Fjord), and a deformed specimen in the Kristiania Fjord. Aurivillius mentions it from Kvæningen, and I found it in the early part of 1899 in various places from Lofoten to Porsanger Fjord. In the mean time, I would set Lofoten as the southern limit of the species on our coast; for the single (possibly also subfossilised) specimen found by M. Sars at Vallø in the Kristiania Fjord, does not justify the removal of the distribution limit thither. Nor has it been found again at Beian since Sars's day. It is, however, an interesting fact that this peculiarly arctic form has been observed during this century both in the Trondhjem and Kristiania Fjords. In order to give a representation of the physical conditions in which *Defrancia lucernaria* lives, I will give the depth, temperature and salinity at some of the places where the species was observed during my journey at the beginning of 1899, and at the North Atlantic Expedition Stations.

1899	Place	Depth	Temperature	Salinity
March 3	Kirkfjord (Moskenesø)	50 m.	2.5° C.	33.40 ‰
April 19	Kvæningen	90 -	0.75° -	34.21 -
„ 21	Jøkelfjord	90 -	1.4° -	34.35 -
„ 27	Porsanger Fjord .	200 -	0.2° -	34.48 -

For Nordhavsexpeditionens findesteder stiller naturforholdene sig saaledes:

Station	Dybde	Temperatur
267	271 m.	$\div 1.4^{\circ}$ C.
290	349 -	3.5° -
323	408 -	1.5° -
357	229 -	1.9° -
363	475 -	1.1° -

With regard to the North Atlantic Expedition, the natural conditions in the places of occurrence are as follows:

Station	Depth	Temperature
267	271 m.	$- 1.4^{\circ}$ C.
290	349 -	3.5° -
323	408 -	1.5° -
357	229 -	1.9° -
363	475 -	1.1° -

Ctenostomata.

Fam. Alcyonidiidae.

Gen. Alcyonidium.

Alcyonidium gelatinosum, Linn.

Hincks (8), p. 491, tab. 69, fig. 1—3.

Levinsen (14), p. 80, tab. 7, fig. 21—28.

Findesteder. Østhavet (sandsynligvis St. 322), St. 260, 363.

Udbredt fra Spitsbergen til Kanalen og fra Novaja Semlja til Grønland.

Alcyonidium disciforme, Smitt.

Alcyonidium mamillatum, var. *disciforme*, Smitt (24, V), p. 1123, tab. 20, fig. 9.

Alcyonidium disciforme, Levinsen (15), p. 23, tab. 27, fig. 13.

” ” Smitt (26), p. 11.

” ” Bidekap (1), p. 633.

Findesteder. St. 267, 323.

Denne eiendommelige *alcyonidium* er før funden i Karahavet (Levinsen, Smitt), mellem Norge og Spitsbergen (Smitt), samt ved Østspitsbergen (Bidekap). Paa min ekspedition vinteren 1899 tog jeg desuden 3 eksemplarer i Lyngen-fjorden (320 m., lerbund, temp. 3.65° C., saltgeh. 34.84 ‰). Arten blir saaledes ogsaa at henføre til Norges fauna.

De eksemplarer, hvorpaa Smitts beskrivelse baseredes, var skiveformede, mens de, som Levinsen og Bidekap

Ctenostomata.

Fam. Alcyonidiidæ.

Gen. Alcyonidium.

Alcyonidium gelatinosum, Linn.

Hincks (8), p. 491; Pl. LXIX, figs. 1—3.

Levinsen (14), p. 80; Pl. VII, figs. 21—28.

Occurrence. The Barents Sea (probably Station 322), St. 260, 363.

Distributed from Spitsbergen to the English Channel, and from Novaja Semlja to Greenland.

Alcyonidium disciforme, Smitt.

Alcyonidium mamillatum var. *disciforme*, Smitt (24, V), p. 1123; Pl. XX, fig. 9.

Alcyonidium disciforme, Levinsen (15), p. 23; Pl. XXVII, fig. 13.

” ” Smitt (26), p. 11.

” ” Bidekap (1), p. 633.

Occurrence. St. 267, 323.

This characteristic *Alcyonidium* has been found in the Kara Sea (Levinsen, Smitt), between Norway and Spitsbergen (Smitt), and at Eastern Spitsbergen (Bidekap). During my expedition in the early part of 1899, I also found 3 specimens in the Lyngen Fjord (depth 320 m., clay bottom, temperature 3.65° C., salinity 34.84 ‰). The species may thus also be classed among the fauna of Norway.

The specimens upon which Smitt's description was based, were disc-shaped, while those that Levinsen and

havde til undersøgelse, dannede flade ringe. Fra St. 323 havde jeg flere kolonier, hvoraf enkelte dannede en skive, andre en flad ring, og atter andre havde form af en liden hætte. Paa St. 267 samt i Lyngenfjorden forekom de ogsaa dels i ring, dels i skiveform. Hidtil er altsaa *a. disciforme* kun funden i den østlige del af Ishavet.

Blandt Nordhavsekspektionens materiale fandtes ogsaa en liden koloni af *rabdopleura* (fra St. 10), men den var saa daarlig konserveret, at man intet væsentligt kunde se paa den. Det eneste, som saaledes kan konstateres, er alene forekomsten paa nævnte sted.

Selv om man til Norges fauna henfører alt, som findes indenfor territorialgrænsen (4 kv.mil fra land), blir der dog 3—4 arter i foranstaaende fortegnelse, som ialfald foreløbig ikke kan medregnes til vor fauna. Disse er, *menipea normani*, *membranipora spitsbergensis*, *entalophora deflexa* og sandsynligvis *membranipora cornigera*. Forøvrigt kan bemærkes, at fortsatte undersøgelser i fjordene nordpaa ganske sikkert vil fremdrage en og anden form, som er funden ved Spitsbergen f. eks., men ikke i Finmarken. Efter en løs mønstring af det materiale, som jeg medbragte fra min vinterekspedition 1899, har jeg for faunaen indvundet to nye og eiendommelige polyzoformer, nemlig *smittia trispinosa* var. *arborea* og *alcyonidium disciforme*. Den første fra Porsanger-, den anden fra Lyngenfjorden. Efter de hydrografiske undersøgelser, som jeg fik anledning til at anstille, finder jeg det heller ikke paafaldende, at høiarktiske polyzoer forekommer i de nordlige fjorde. I Porsangerfjorden mellem store og lille Tamsø fandtes saaledes 27de april 1899 paa bunden i 200 meters dyb en temperatur 0.2° C. og saltgehalt 34.48 ‰. Paa dette sted tog jeg *smittia trispinosa* var. *arborea*. I Lyngenfjordens ytre del maalte jeg 3die mai 1899 i 320 meters dyb (bund) temperaturen 3.65° C. Saltgehalten fandtes senere ved titrering at være 34.84 ‰. Her forekom blandt andet ogsaa *alcyonidium disciforme*. I Jøkelfjorden (arm af Kvæningen) var den 20de april 1899 i 80 meters dyb temp. 0.9° C., saltgeh. 34.29 ‰. Her tog jeg diverse arktiske polyzoer saasom *myrionozoum crustaceum*, *mucronella sincera*, *rhamphostomella scabra*, *defrancia lucernaria*, etc. Imidlertid vil jeg her ikke gaa nærmere ind paa den hydrografiske side af sagen, jeg vil kun nævne at det voksende kjendskab til fjordenes og havkystens hydrografi utvilsomt vil bidrage til løsningen af adskillige zoogeografiske spørgsmål.

Hincks (8) opfører 235 arter af polyzoer for den britiske fauna og for 28 af disse er Shetland den eneste britiske lokalitet. Af de 28 var 8 ikke funden udenfor Shet-

Bidenkap examined were in the form of flat rings. I had several colonies from Station 323, in which some were in the form of a disc, others of a flat ring, while others again were in the form of a little cowl. At Station 267 and in the Lyngen Fjord, too, they occurred partly in the shape of rings, partly discoidal. *A. disciforme* has thus hitherto only been found in the eastern part of the Polar Sea.

A little colony of *Rabdopleura* (from Station 10) was also in the North Atlantic Expedition collection; but it was in such a bad state of preservation, that nothing of any consequence could be seen in it. The only thing that can be proved is its occurrence in the above-named place.

Even if all that are found within four miles of the shore, were to be referred to Norway's fauna, there would still be 3 or 4 species in the above list, that for the present, at any rate, cannot be reckoned among our fauna. These are *Menipea normani*, *Membranipora spitsbergensis*, *Entalophora deflexa*, and probably *Membranipora cornigera*. It may be further remarked that continued investigations of the northern fjords will certainly bring to light some form or other that is found, for instance, in Spitsbergen, but not in Finmark. After a casual review of the collection that I brought back from my expedition in 1899, I find that I have added two new and characteristic forms of Polyzoa to the fauna, namely, *Smittia trispinosa* var. *arborea* and *Alcyonidium disciforme*, the first from Porsanger, the second from Lyngen Fjord. After the hydrographic investigations that I was enabled to prosecute, I do not consider it at all remarkable that extreme arctic Polyzoa should occur in the fjords of the north. In the Porsanger Fjord, between Great and Little Tamsø, for instance, there was found, on April 27th, 1899, on the bottom at a depth of 200 metres, a temperature of 0.2° C., and salinity 34.48 ‰. At this spot I found *Smittia trispinosa* var. *arborea*. In the lower part of Lyngen Fjord, on May 3rd, 1899, I found on the bottom, at a depth of 320 metres, a temperature of 3.65° C. The salinity was subsequently found by titration to be 34.84 ‰. *Alcyonidium disciforme* occurred here, among others. In Jøkelfjorden, an arm of Kvæningen, on April 20th, 1899, at a depth of 80 metres, the temperature was 0.9° C., the salinity 34.29 ‰. Here I found various arctic Polyzoa, such as *Myrionozoum crustaceum*, *Mucronella sincera*, *Rhamphostomella scabra*, *Defrancia lucernaria*, etc. I shall not, however, go further into the hydrographical side of the question here. I will only remark that the increasing knowledge of the hydrography of the fjords and coast will contribute to the solution of various zoogeographical questions.

Hincks (8) puts down 235 species of Polyzoa as belonging to the British fauna, and for 28 of these the Shetland Isles is the only locality. Eight of these 28 were

land, og de resterende 20, som næsten alle er arktiske former, har her fundet sin sydgrænse. Den engelske polyzoafauna omfatter omtrent dobbelt saa mange arter som den norske, der er endvidere et betydeligt fællesskab i former baade af boreal og arktisk natur, men der gives dog adskillige norske arter, som ikke forekommer ved Storbritanniens kyster. Disse er for den allerstørste del af ren arktisk karakter. Af saadanne har jeg hidtil merket mig følgende:

Menipea normani, Nordg.
Kinetoskias smittii, Dan. & Koren.
 „ *arborescens*, Dan. & Koren.
Flustra membranaceo-truncata, Smitt.
 „ *abyssicola*, M. Sars.
Membranipora cymbæformis, Hincks.
 „ *arctica*, D'Orb.
Cribrilina nitido-punctata, Smitt.
 „ *scutulata*, Busk.
Myriozeugum crustaceum, Smitt.
 „ *coarctatum*, M. Sars.
Lepralia spathulifera, Smitt.
Porella elegantula, D'Orb.
 „ *proboscidea*, Hincks.
Escharoides sarsii, Smitt.
Smittia porifera, Smitt.
 „ *arctica*, Norman.
 „ *lineata*, Nordg.
 „ *reticulato-punctata*, Hincks.
 „ *propinqua*, Smitt.
 „ *palmata*, M. Sars.
 „ *trispinosa* var. *arborea*, Levinsen.
Mucronella (lepralia), *cruenta*, Norman.
 „ *labiata*, Boeck.
 „ *sincera*, Smitt.
Retepora cellulosa, Linn.
 „ *elongata*, Smitt.
Rhamphostomella scabra, Fabr.
 „ *costata*, Lorenz.
 „ *plicata*, Smitt.
Cellepora nodulosa, Lorenz.
 „ *incrassata*, Lamarck.
Reticulipora intricaria, Smitt.
Defrancia lucernaria, M. Sars.
Alcyonidium disciforme, Smitt.

En flersyd af de her opførte er ikke ved vor kyst observeret søndenfor polarcirklen, men der gives ogsaa enkelte, som forekommer søndenfor denne, men alligevel er utvilsomt arktiske. En saadan er f. eks. *Kinetoskias arborescens*. Den er funden i Karahavet paa 20—58 favne (Levinson), i Wijdebay paa Spitsbergen i 40 favne (Smitt), endvidere har Danielsen taget den ved Vadsø, 90 favne. Naar saa Nordhavsekspektionen tog den samme art paa et dyb af 672 favne i Sognefjorden, maa det være et eksempel blandt flere paa, at en arktisk form har holdt sig gjennem

Den norske Nordhavsekspektion. O. Nordgaard: Polyzoa.

not found out of the Shetlands, and the remaining 20, which were nearly all arctic forms, had their southern limit there. The British polyzoan fauna comprises about twice as many species as the Norwegian. They have moreover, a considerable number of forms in common, but there are also a good many Norwegian species that do not occur on the shores of Great Britain. By far the greater number of these are of a purely arctic character. Of these, I have up to the present noted the following:

Menipea normani, Nordg.
Kinetoskias smittii, Dan. & Koren.
 „ *arborescens*, Dan. & Koren.
Flustra membranaceo-truncata, Smitt.
 „ *abyssicola*, M. Sars.
Membranipora cymbæformis, Hincks.
 „ *arctica*, D'Orb.
Cribrilina nitido-punctata, Smitt.
 „ *scutulata*, Busk.
Myriozeugum crustaceum, Smitt.
 „ *coarctatum*, M. Sars.
Lepralia spathulifera, Smitt.
Porella elegantula, D'Orb.
 „ *proboscidea*, Hincks.
Escharoides sarsii, Smitt.
Smittia porifera, Smitt.
 „ *arctica*, Norman.
 „ *lineata*, Nordg.
 „ *reticulato-punctata*, Hincks.
 „ *propinqua*, Smitt.
 „ *palmata*, M. Sars.
 „ *trispinosa* var. *arborea*, Levinsen.
Mucronella (lepralia), *cruenta*, Norman.
 „ *labiata*, Boeck.
 „ *sincera*, Smitt.
Retepora cellulosa, Linn.
 „ *elongata*, Smitt.
Rhamphostomella scabra, Fabr.
 „ *costata*, Lorenz.
 „ *plicata*, Smitt.
Cellepora nodulosa, Lorenz.
 „ *incrassata*, Lamarck.
Reticulipora intricaria, Smitt.
Defrancia lucernaria, M. Sars.
Alcyonidium disciforme, Smitt.

The majority of the species in this list have not been observed on our coast south of the arctic circle; but there are also a few that do occur south of this, but are nevertheless undoubtedly arctic. *Kinetoskias arborescens* is one of these. It was found in the Kara Sea in depths of 20—58 fathoms (Levinson), in Wijde Bay in Spitsbergen, at a depth of 40 fathoms (Smitt), and Danielsen has found it at Vadsø, 90 fathoms. That the North Atlantic Expedition found the same species at a depth of 672 fathoms in the Sognefjord, must be taken as one instance among

de skiftende tider paa de store dyb i vore fjorde. Disse fjorddyb udmerker sig ved en stor stabilitet i de fysiske forhold. Temperaturen er 6—7° C. og saltgehalten 35 ‰ eller lidt over. Det ligger da nær at antage, at saadanne forhold ogsaa maa egne sig vel for former af sydlig oprindelse. Selv saa langt mod nord som i Vestfjordens dybbassin har G. O. Sars fundet bundfaunaen at være væsentlig sydlig, mens nævnte fjords littoralfauna havde et arktisk præg. Littoralfaunaens større afhængighed af den geografiske bredde bunder sandsynligvis i hydrografiske forhold, idet vandlaget fra 0—200 à 250 meter staar under direkte indflydelse af de meteorologiske faktoreres aarlige variation.

I Vestfjordens største dyb (Tranødybet) tog jeg 16de marts 1899 ved trawling i en dybde af en dybde af ca. 600 meter 3 eksemplarer af *Kinetoskias smittii*. Temperaturen var 6.3° C., saltgehalten 35.06 ‰, den aarlige forandring er for intet at regne. *Kinetoskias arborescens* i Sognefjorden, og *smittii* i Vestfjorden levede saaledes under omtrent de samme hydrografiske forhold, men det er aabenbart stor forskjel paa deres zoogeografiske karakter. Den første er arktisk, og den maa i Sognefjorden betragtes som en relict form, mens *Kinetoskias smittii* baade af andre og af mig er taget i en flerhed af eksemplarer i de vestlandske fjorde, Trondhjemsfjorden, o. s. v., men den er ikke taget i egentlig arktiske farvand, følgelig maa den være boreal og ved sin optræden i Vestfjorden, Tysfjorden etc. betegnes som en sydlig emigrant. Denne betegnelse kan uden tvil ogsaa anvendes paa *Bicellaria alderi* ved dens forekomst paa St. 315 (74° 53' N. Br.). Havde Golfstrømmen ikke været, vilde visselig ogsaa denne polyzo have manglet paa dette sted. Derimod er *Flustra abyssicola* en arktisk og gammel form, sandsynligvis den ældste af de recente flustraer.

Den norske polyzoverdens stærkt arktiske karakter giver sig blandt andet tydeligt tilkjende ved sammenligning med Grønlands. At Vanhöffens fortegnelse*) (30, p. 233) har jeg noteret følgende, som endnu ikke er fundne ved norsk kyst:

Cellaria articulata, Fabr.
Flustra serrulata, Busk.
Schizoporella biaperta, Michelin.
Hippothoa expansa, Dawson.
Porella acutirostris, Smitt.
 „ *perpusilla*, Busk.
Cellepora whiteavesi, Norman.
Stomatopora penicillata, Fabr.
 „ *diastoporoides*, Norman.

*) Denne fortegnelse er, saavidt jeg kan forstaa, meget fuldstændig. Idetmindste én art er dog udeglemt, nemlig *Cribrilina scutulata*, Busk.

many of an arctic form having remained through changing periods in the great depths in our fjords. These fjord-depths are remarkable for a great stability in their physical conditions. The temperature is 6° or 7° C., and the salinity 35 ‰ or a little more. It is then natural to suppose that such conditions must also be well adapted for forms of southern origin. This, too, has proved to be the case. Even as far north as in the deep basin of the Vestfjord, G. O. Sars has found the bottom fauna to be essentially southern, while the littoral fauna of the same fjord was arctic in character. The great dependence of the littoral fauna upon the geographical latitude, probably rests upon hydrographical conditions, as the water-stratum from 0 to 200 or 250 metres, is under the direct influence of the annual variations of the meteorological factors.

In the Vestfjord's greatest depth (Tranø depth), on March 16th, 1899, I caught, when trawling in a depth of about 600 metres, 3 specimens of *Kinetoskias smittii*. The temperature was 6.3° C., the salinity 35.06 ‰, the annual variation cannot be reckoned as anything. Thus *Kinetoskias arborescens* in the Sognefjord, and *smittii* in the Vestfjord, lived under almost the same hydrographical conditions; but there is evidently a great difference between their zoogeographical characters. The first is arctic, and in the Sognefjord it must be regarded as a relict form; while a number of specimens of *Kinetoskias smittii* have been found by myself and others in the west-country fjords, the Trondhjem Fjord, etc., but it has not been found in truly arctic waters. It must therefore be boreal, and in its appearance in the Vestfjord, Tysfjord etc., be designated a southern emigrant. This designation may also without doubt be used for *Bicellaria alderi*, from its occurrence at Station 315 (74° 53' N. Lat.). Had there been no Gulf Stream, this polyzoan would certainly not have been found in this place. On the other hand, *Flustra abyssicola* is arctic, and an early form, probably the earliest of the recent *Flustra* species.

The extremely arctic character of the Norwegian Polyzoa is clearly seen, among other things, by a comparison with that of Greenland. I have noted down the following species from Vanhöffen's list*) (30, p. 233), which have not been found on the Norwegian coast:

Cellaria articulata, Fabr.
Flustra serrulata, Busk.
Schizoporella biaperta, Michelin.
Hippothoa expansa, Dawson.
Porella acutirostris, Smitt.
 „ *perpusilla*, Busk.
Cellepora whiteavesi, Norman.
Stomatopora penicillata, Fabr.
 „ *diastoporoides*, Norman.

*) As far as I am able to judge, this list is very complete, but one species at least, has been omitted, namely, *Cribrilina scutulata*, Busk.

Diastopora maeandrina, Wood.
Bowerbankia arctica, Busk.
Buskia nitens, Alder.

Disse udgjør omtrent 14 pct. af samtlige arter i for-
 tegnelsen. Størsteparten af de ovenfor anførte arter er
 heller ikke observeret ved Spitsbergen eller i Karahavet.

Af de 7 arktiske former, som forekommer ved Queen
 Charlotte Islands men ikke ved britiske kyster er den kun
 én nemlig *Cellaria articulata*, som endnu ikke er indlemmet
 i vor fauna. De øvrige 6 (*Flustra membranaceo-truncata*,
Membranipora arctica, *Myrionozoum coarctatum*, *Rhamphosto-*
mella plicata, *Cellepora incrassata*, *Retepora elongata*) er
 vel kjendte fra vor arktiske region.

Da jeg sommeren 1894 udenfor Nordkyn i Finmarken
 tog op en *Laminaria hyperborea*, som fra grunden til
 toppen (70 cm.) var tæt besat med *Gemellaria loricata* i
 yppig vekst, blev jeg slaaet over denne tydelige tilkjende-
 givelse af livskraft. Paa min reise forleden vinter havde
 jeg anledning til at skrabe noget i trange og strømsterke
 sund i Finmarken, og det viste sig ogsaa der, at enkelte
 arter som *Gemellaria*, *Menipea*, etc. havde en enestaaende
 kraftig vekst. Studiet af polyzoerne bekræfter saaledes det
 almindelige indtryk, at arktiske dyr i regelen er kraftige
 og velfødde. Med andre ord, arktiske former viser over-
 legenhed i størrelse og udvikling i det hele taget fremfor
 sin nære slegtninge blandt de boreale dyr. Dr. Pfeffer*)
 udtaler ogsaa om polyzoerne: „Sie fehlen nirgends völlig,
 sind aber in den Tropen und den grossen Tiefen sparsamer,
 dagegen in den kälteren gemässigten Zonen am häufigsten
 nächstdem in den polaren Zonen am besten entwickelt“.
 Hvad kan grunden være hertil? Jeg tror, at polyzoernes
 rige udvivelser i de polare have hænger sammen med de
 selvsamme haves store planktonrigdom. Ifølge sin bygning
 og sit fastsiddende voksesæt er polyzoerne udelukkende
 henvist til at leve af plankton eller af organiske rester,
 som findes suspenderet i vandet**). Heraf synes at frem-

Diastopora maeandrina, Wood.
Bowerbankia arctica, Busk.
Buskia nitens, Alder.

These amount to about 14 per cent of the total
 number of species in the list. The greater number of the
 above-named species have not been observed in Spitsbergen
 or the Kara Sea.

Of the 7 arctic forms that occur in Queen Charlotte
 Islands, but not on the shores of Great Britain, there is
 only one, namely *Cellaria articulata*, that has not yet been
 incorporated in our fauna. The other 6 (*Flustra mem-*
branaceo-truncata, *Membranipora arctica*, *Myrionozoum coar-*
ctatum, *Rhamphostomella plicata*, *Cellepora incrassata*, *Ret-*
epora elongata) are well known from our arctic region.

In the summer of 1894, when, off Nordkyn in Fin-
 mark, I drew up a *Laminaria hyperborea* that was covered
 from top to bottom (70 cm.) with a luxuriant growth of
Gemellaria loricata, I was struck with this clear evidence
 of vital force. During my expedition last winter, I had
 occasion to dredge a little in narrow channels in Finmark
 where the current was strong, and it proved that there
 too, certain species, such as *Gemellaria*, *Menipea*, etc.
 were of an exceptionally strong growth. The study of
 polyzoans thus strengthens the general impression that
 arctic animals as a rule are strong and thriving. In other
 words, arctic forms on the whole, exhibit a superiority as
 to size and development, to their near relations among
 the boreal animals. Dr. Pfeffer*) also says of polyzoans:
 „Sie fehlen nirgends völlig, sind aber in den Tropen und
 den grossen Tiefen sparsamer, dagegen in den kälteren
 gemässigten Zonen am häufigsten nächstdem in den polaren
 Zonen am besten entwickelt“. What can be the reason
 of this? I believe that the luxuriant development of the
 Polyzoa in the polar sea is connected with the great
 abundance of plankton in that sea. From their structure
 and their fixed manner of growth, polyzoans are compelled
 to live exclusively on plankton or organic remains that
 are found suspended in the water**). From this it would

*) Die niedere Tierwelt des antarktischen Ufergebietes.

**) Ved en enkelt anledning har jeg seet individerne i en polyzo-
 koloni foretage bevægelser, som jeg opfattede som spisning.
 Paa ruderne i et af akvarierne ved den biologiske station
 havde nemlig fæstet sig kolonier af *Membranipora membranacea*,
 uidentvil grundlagt af larver, som var indkomne med led-
 ningsvandet. Jeg kunde da tydeligt se, hvorledes polypiderne
 uophørligt skjøv sin tentakelkrans sammenlagt i form af et
 rør ud af munden, derpaa sprede kransen ud i tragtform
 for saa efter en liden stunds forløb at trække den ind. Det
 er muligt at dette ogsaa var en aandedrætsbevægelse, men at
 der paa den maade tillige skede en tilførsel af næring, synes
 mig utvilsomt. Egentlig talt kan man neppe tænke sig nogen
 anden maade at spise paa for disse dyr. I det samme akva-
 rium har jeg seet en sjøpølse (*Cucumaria frondosa*) foretage
 tentakelbevægelser, som ganske sikkert havde med ernæringen
 at gøre. Hos *Cucumaria* blev ikke hele tentakelkransen trukket
 ind samtidig, men hver enkelt af hovedgrenene blev afvekslende
 puttet ind i munden.

*) Die niedere Tierwelt des antarktischen Ufergebietes.

**) On one occasion I have seen the individuals in a colony of
 Polyzoa going through movements which I took to be eating.
 Colonies of *Membranipora membranacea* had fastened them-
 selves to the glass in one of the aquaria in the biological
 station, without doubt growing upon larvæ that had come
 in with the water-supply. I could distinctly see how the
 polypides incessantly pushed out their circlet of tentacles
 folded together in the form of a tube, and then spread them
 out in a funnel-shape, only to draw them in again in a little
 while. It is possible that this was also a respiratory move-
 ment, but I have no doubt whatever that in this way a
 supply of nourishment was also taken in. Strictly speaking,
 it is hardly possible to imagine any other way for these ani-
 mals to eat. In the same aquarium, I have also seen a sea-
 cucumber (*Cucumaria frondosa*) making tentacular movements
 which were certainly connected with feeding. In *Cucumaria*
 the whole circlet of tentacles was not drawn in at once, but
 each of the main branches was put into the mouth in turn.

gaa med sikkerhed, at polyzomængden maa staa i afhængighedsforhold til planktonmængden. Jeg skal imidlertid ikke her gaa nærmere ind paa dette spørgsmål. Ved de paa-begyndte undersøgelser i det nordlige Norge haaber jeg senere at kunne levere bidrag til forstaaelse af polyzoernes samt ogsaa andre dyregruppers biologi.

appear without doubt that the quantity of polyzoans must be dependent upon the quantity of plankton. I shall not, however, go further into this question here. After the investigations begun in northern Norway, I hope to be able subsequently to contribute towards an understanding of the biology of the Polyzoa and other groups of animals.

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Bidenkaps arbeide i Tromsø museums aarshefte, 20, 1897 (Undersøgelser over Lyngenfjordens evertebratfauna) kom mig ihænde, efterat manuscriptet var næsten færdigt.

Bidenkap's paper in the Tromsø Museum Year-book, 20, 1897 (Undersøgelser over Lyngenfjordens evertebratfauna) did not come under my notice until my manuscript was almost ready.

Figurforklaring.

- Fig. 1. *Myrionozoum coarctatum*, M. Sars. Koloni fra Malangen (taget af mig) 1/1
- 2. *Menipea normani*, n. sp. Koloni fæstet til en liden sten 1/1
- 3. *Menipea normani*. Den nederste del af stammen 17/1
- 4. *Menipea normani*. Del af en gren, det øverste avicularium er afbrudt 60/1
- 5. *Menipea normani*. Bagsiden af zoarieret visende udspringet af kitintuberne (the radical fibres), af hvilke den øverste løber efter basis af en bifurkation 60/1
- 6. *Menipea normani*. Bagsiden af to zoécier visende beliggenheden af de laterale avicularier (a) 60/1
- 7. *Menipea normani*. Zoéciemundingen og frontaviculariet 60/1
- 8. *Menipea normani*. Frontaviculariet seet fra siden 100/1
- 9. *Smittia trispinosa*, var. *arborea*, Levinsen. Koloni fra St. 357 1/1
- 10. *Entalophora deflexa*, Smitt. Koloni paa en liden sten (St. 363) 3/1
- 11. *Entalophora deflexa*, Smitt. Stykke af en gren 30/1
- 12. *Reticulipora intricaria*, Smitt. Stykke af zoarieret 1/1
- 13. *Mucronella sincera*, Smitt. Zoécier af en koloni fra havet ved Nordkap 30/1
- 14. *Mucronella sincera*, Smitt. Zoécier af en koloni fra Nordhavexp. (ukjendt sted) 30/1
- 15. *Mucronella sincera*, Smitt. Zoécier af en koloni fra Hammerfest 30/1
- 16. *Defrancia lucernaria*, M. Sars. Koloni fra St. 323 1/1
- 17. *Defrancia lucernaria*, M. Sars. Koloni fra samme sted, seet ovenfra 1/1

Explanation of the Figures.

- Fig. 1. *Myrionozoum coarctatum*, M. Sars. Colony from Malangen (found by the author) 1/1
- 2. *Menipea normani*, n. sp. Colony attached to a small stone 1/1
- 3. *Menipea normani*. Lower part of stem 17/1
- 4. *Menipea normani*. Part of branch; uppermost avicularium broken off 60/1
- 5. *Menipea normani*. Back of zoarium, showing origin of chitinous tubes (radical fibres), of which the uppermost runs along the base of a bifurcation 60/1
- 6. *Menipea normani*. Back of two zoëcia, showing position of lateral avicularia (a) 60/1
- 7. *Menipea normani*. Mouth of zoëcium, and anterior avicularium 60/1
- 8. *Menipea normani*. Anterior avicularium, seen from side 100/1
- 9. *Smittia trispinosa*, var. *arborea*, Levinsen. Colony from Station 357 1/1
- 10. *Entalophora deflexa*, Smitt. Colony on small stone (St. 363) 3/1
- 11. *Entalophora deflexa*, Smitt. Part of a branch 30/1
- 12. *Reticulipora intricaria*, Smitt. Piece of zoarium 1/1
- 13. *Mucronella sincera*, Smitt. Zoëcia of a colony from the North Cape 30/1
- 14. *Mucronella sincera*, Smitt. Zoëcia of colony from N. Atl. Exp. (place unknown). 30/1
- 15. *Mucronella sincera*, Smitt. Zoëcia of colony from Hammerfest 30/1
- 16. *Defrancia lucernaria*, M. Sars. Colony from Station 323 1/1
- 17. *Defrancia lucernaria*, M. Sars. Colony from same place, seen from above 1/1

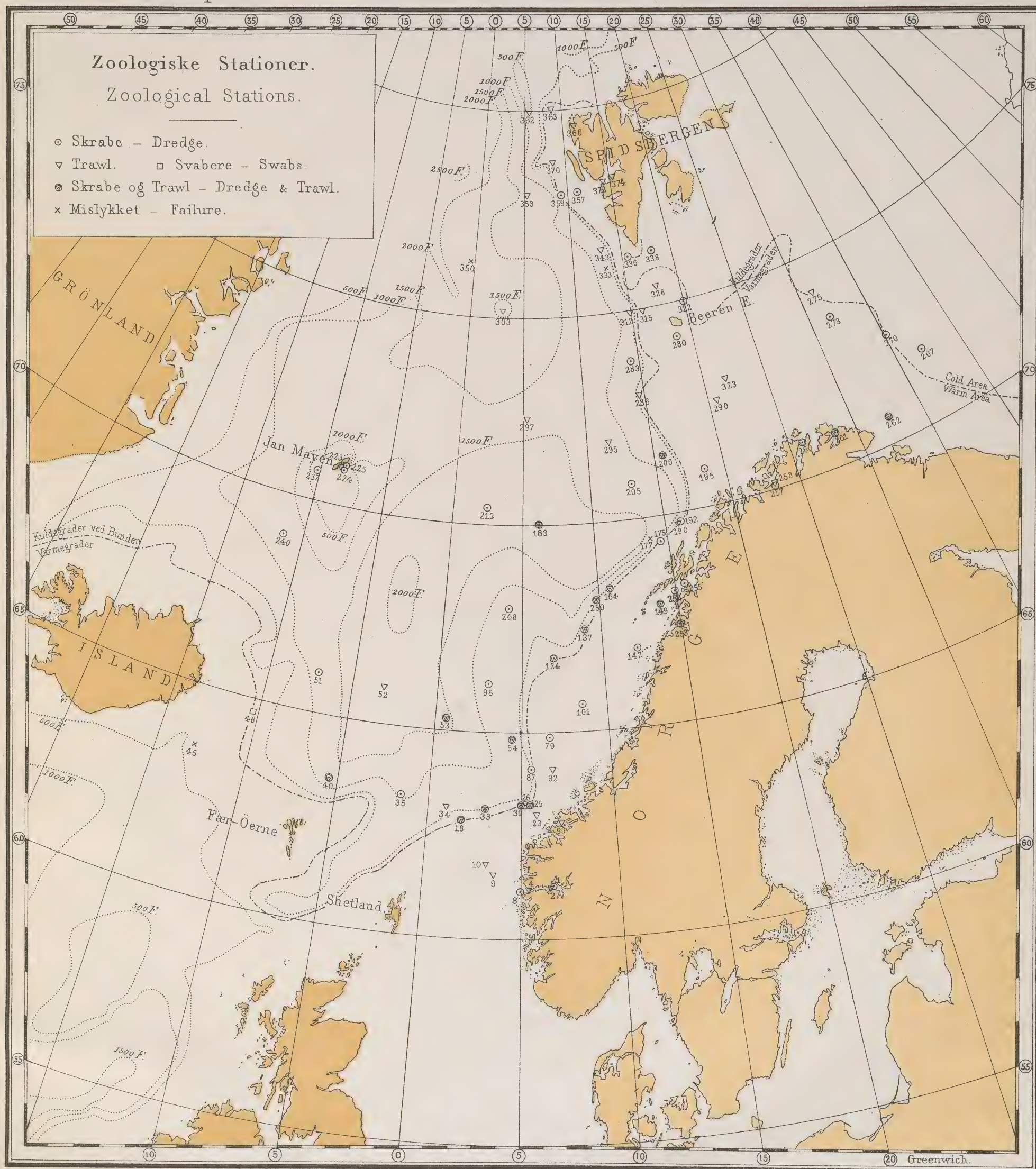


Fig. 1-4, 9-12, 16-17, H. Bucher del. Fig. 5-8, 13-15, O. Nordgaard del.

Zoologiske Stationer.
(Zoological Stations.)

Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)	Længde fra Greenwich. (Longitude)	Dybde. (Depth.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere (Swabs.)
				Engl. Favne. (Fathoms.)	Meter. (Metres.)				
1876									
1	Juni 3	61° 13'	6° 36' E.	650	1189	6.6	Sandler.	Sabulous Clay.	S.
2	(June) 3	61 10	6 32 E.	672	1229	6.7	Sandler.	Sabulous Clay.	T.
4	" 8	61 5	5 14 E.	566	1035	6.6	Sandler; Grus, Singel.	Sabulous Clay, Pebbles.	T.
8	" 9	61 0	4 49 E.	200	366	6.6	Ler, Sand, Sten.	Clay, Sand, Stones.	S.
9	" 20	61 30	3 37 E.	206	377	5.9	Ler.	Clay.	T.
10	" 21	61 41	3 19 E.	220	402	6.0	Slik, Ler.	Ooze, Clay.	T.
18	" 21	62 44	1 48 E.	412	753	—1.0	Ler.	Clay.	S. T.
23	" 23	62 52	5 50 E.						T.
25	" 28	63 10	5 25 E.	98	179	6.9	Sandler.	Sabulous Clay.	T. S.
26	" 28	63 10	5 16 E.	237	433	7.1	Sandler.	Sabulous Clay.	S.
31	" 29	63 10	5 0 E.	417	763	—1.0	Sandler.	Sabulous Clay.	S. T.
33	" 30	63 5	3 0 E.	525	960	—1.1	Ler.	Clay.	T. S.
34	Juli 1	63 5	0 53 E.	587	1073	—1.0	Ler.	Clay.	T.
35	(July) 5	63 17	1 27 W.	1081	1977	—1.0	Biloculinler.	Biloculina Clay.	S.
40	" 18	63 22	5 29 W.	1215	2222	—1.2	Biloculinler.	Biloculina Clay.	S. T.
48	Aug. 6	64 36	10 22 W.	299	547	—0.3	Mørkegraat Ler.	Dark-grey Clay.	s.
51	" 7	65 53	7 18 W.	1163	2127	—1.1	Biloculinler.	Biloculina Clay.	S.
52	" 8	65 47	3 7 W.	1861	3403	—1.2	Biloculinler.	Biloculina Clay.	T.
53	" 10	65 13	0 33 E.	1539	2814	—1.3	Biloculinler.	Biloculina Clay.	S & T.
54	" 12	64 47	4 24 E.	601	1099	—1.2	Biloculinler.	Biloculina Clay.	S & T.
60	" 20	64 40	9 30 E.	118	216	7.0	Haardt Ler.	Hard Clay.	S.
78	" 21	64 48	6 45 E.	155	283	7.0	Sandler.	Sabulous Clay.	S.
79	" 21	64 48	6 32 E.	155	283	6.9	Sandler.	Sabulous Clay.	S.
87	" 22	64 2	5 35 E.	498	911	—1.1	Ler.	Clay.	S.
92	" 22	64 0	6 42 E.	178	326	7.2	Sandholdigt Ler.	Sabulous Clay.	T.
93	" 24	62 41	7 8 E.	158	289	6.4	Blødt Ler.	Soft Clay.	T.
(Romsdalsfjord).									
1877									
96	Juni 16	66 8	3 0 E.	805	1472	—1.1	Biloculinler.	Biloculina Clay.	S.
101	(June) 17	65 36	8 32 E.	223	408	6.0	Sandler.	Sabulous Clay.	S.
124	" 19	66 41	6 59 E.	350	640	—0.9	Grovkornet Ler.	Coarse Clay.	S. T.
137	" 21	67 24	8 58 E.	452	827	—1.0	Ler.	Clay.	S. T.
147	" 22	66 49	12 8 E.	142	260	6.2	Graat Ler.	Grey Clay.	S.
149	" 23	67 52	13 58 E.	135	247	4.9	Ler.	Clay.	T. S.
(Vestfjord).									
164	" 29	68 21	10 40 E.	457	836	—0.7	Sandler.	Sabulous Clay.	S. T.
175	Juli 2	69 17	14 35 E.	415	759	3.0	Sand, Stene.	Sand, Stones.	S.
176	(July) 3	69 18	14 33 E.	536	980	—0.2	Ler.	Clay.	S.
177	" 3	69 25	13 49 E.	1443	2639	—1.2	Biloculinler.	Biloculina Clay.	S & T.
183	" 5	69 59	6 15 E.	1710	3127	—1.3	Biloculinler.	Biloculina Clay.	S & T.
190	" 7	69 41	15 51 E.	870	1591	—1.2	Sandholdigt Ler.	Sabulous Clay.	T.
192	" 7	69 46	16 15 E.	649	1187	—0.7	Sandler.	Sabulous Clay.	S.
195	" 16	70 55	18 38 E.	107	196	5.1	Sten, Ler.	Stones, Clay.	S.
200	" 17	71 25	15 41 E.	620	1134	—1.0	Ler.	Clay.	S. T.
205	" 18	70 51	13 3 E.	1287	2354	—1.2	Biloculinler.	Biloculina Clay.	S.
213	" 26	70 23	2 30 E.	1760	3219	—1.2	Biloculinler.	Biloculina Clay.	S.
223	Aug. 1	70 54	8 24 W.	70	128	—0.6	Graasort Sandler.	Dark-grey sabulous Clay	S.
(Jan Mayen).									
224	" 1	70 51	8 20 W.	95	174	—0.6	Graasort Sandler.	Dark-grey sabulous Clay	S.
225	" 2	70 58	8 4 W.	195	357	—0.6	Graasort Sandler.	Dark-grey sabulous Clay	S.
226	" 2	70 59	7 51 W.	340	622	—0.6	Sort Sand og Ler.	Black Sand and Clay.	S.
237	" 3	70 41	10 10 W.	263	481	—0.3	Brunt Ler, Stene.	Brown Clay, Stones.	S.
240	" 4	69 2	11 26 W.	1004	1836	—1.1	Biloculinler.	Biloculina Clay.	S.

Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)	Længde fra Greenwich. (Longitude.)		Dybde. (Depth.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)
					Engl. Favne. (Fathoms.)	Meter. (Metres.)				
248	Aug. 8	67 56	4 11 E.		778	1423	-1.0	Biloculinler.	Biloculina Clay.	S.
251	" 9	68 6	9 44 E.		634	1159	-1.3	Ler.	Clay.	S.
252	" 11	Vestfjord.						Ler.	Clay.	S.
253	" 15	Skjerstadsfjord.			263	481	3.2	Ler.	Clay.	S.
253b	" 17	Saltstrømmen.			90	165		Sten.	Stones.	S.
255	1878. Juni 19	68° 12'	15° 40' E.		341	624	6.5	Ler.	Clay.	S.
257	(June) 21	70 4	23 2 E.		160	293	3.9	Ler.	Clay.	S.
258	" 21	70 13	23 3 E.		230	421	4.0	Ler.	Clay.	T.
260	" 24	70 55	26 11 E.		127	232	3.5	Ler.	Clay.	S. T.
261	" 25	70 47	28 30 E.		127	232	2.8	Ler.	Clay.	S. T.
262	" 27	70 36	32 35 E.		148	271	1.9	Ler.	Clay.	T. S.
267	" 29	71 42	37 1 E.		148	271	-1.4	Ler, Sten.	Clay, Stones.	S.
270	" 30	72 27	35 1 E.		136	249	-0.0	Ler.	Clay.	S.
273	Juli 1	73 25	31 30 E.		197	360	2.2	Ler.	Clay.	S.
275	(July) 2	74 8	31 12 E.		147	269	-0.4	Ler.	Clay.	T.
280	" 4	74 10	18 51 E.		35	64	1.1	Sten.	Stones.	S.
283	" 5	73 47	14 21 E.		767	1403	-1.4	Ler.	Clay.	S.
286	" 6	72 57	14 32 E.		447	817	-0.8	Ler.	Clay.	T.
290	" 7	72 27	20 51 E.		191	349	3.5	Sandler.	Sabulous Clay.	T.
295	" 14	71 59	11 40 E.		1110	2030	-1.3	Biloculinler.	Biloculina Clay.	T.
297	" 16	72 36	5 12 E.		1280	2341	-1.4	Biloculinler.	Biloculina Clay.	T.
303	" 19	75 12	3 2 E.		1200	2195	-1.6	Biloculinler.	Biloculina Clay.	T.
312	" 22	74 54	14 53 E.		658	1203	-1.2	Ler.	Clay.	T.
315	" 22	74 53	15 55 E.		180	329	2.5	Ler, Sand.	Clay, Sand.	T.
322	" 23	74 57	19 52 E.		21	38	0.2	Haard.	Hard.	S.
323	" 30	72 53	21 51 E.		223	408	1.5	Ler.	Clay.	T.
326	Aug. 3	75 31	17 50 E.		123	225	1.6	Ler.	Clay.	T.
333	" 4	76 6	13 10 E.		748	1368	-1.3	Biloculinler.	Biloculina Clay.	T.
336	" 5	76 19	15 42 E.		70	128	0.4	Ler, Haard B.	Clay, Hard Bottom.	S.
338	" 6	76 16	17 49 E.		146	267	-1.1	Sten.	Rock.	S.
343	" 7	76 34	12 51 E.		743	1359	-1.2	Ler.	Clay.	T.
350	" 8	76 26	0 29 W.		1686	3083	-1.5	Biloculinler.	Biloculina Clay.	T.
353	" 10	77 58	5 10 E.		1333	2438	-1.4	Biloculinler.	Biloculina Clay.	T.
357	" 12	78 3	11 18 E.		125	229	1.9	Ler.	Clay.	S.
359	" 12	78 2	9 25 E.		416	761	0.8	Ler.	Clay.	S.
362	" 14	79 59	5 40 E.		459	839	-1.0	Ler.	Clay.	T.
363	" 14	80 3	8 28 E.		260	475	1.1	Ler.	Clay.	T.
366	" 17	79 35	11 17 E.		61	112	-2.1	Ler.	Clay.	T.
"	"	Magdalene Bay.			37	68	-0.2	Ler.	Clay.	T.
370	" 18	78 48	8 37 E.		109	199	1.1	Ler.	Clay.	T.
372	" 19	78 9	14 7 E.		129	236	1.2	Ler.	Clay.	T.
374	" 22	78 16	15 33 E.		60	110	0.7	Ler.	Clay.	T.
		(Advent Bay).								

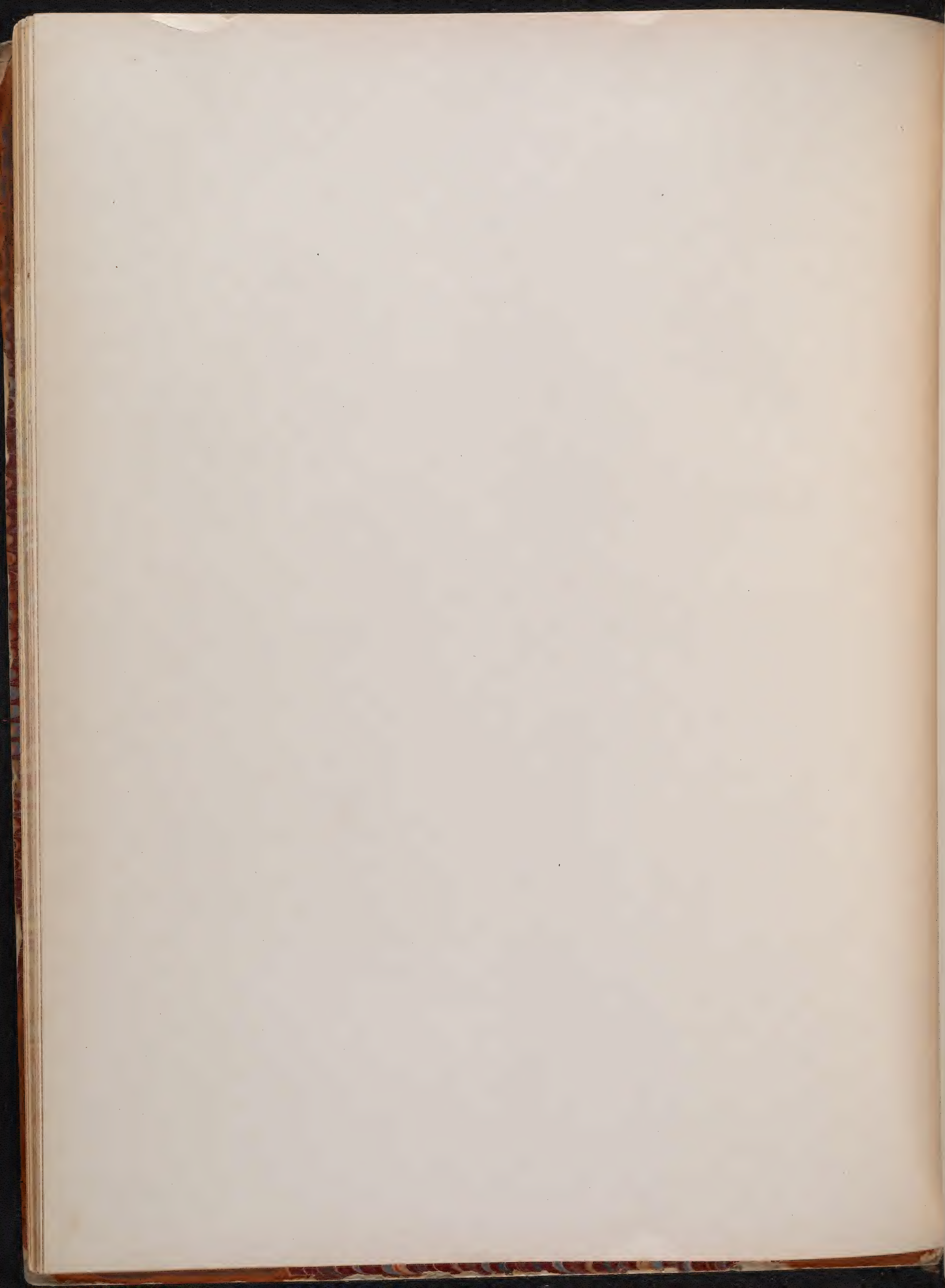


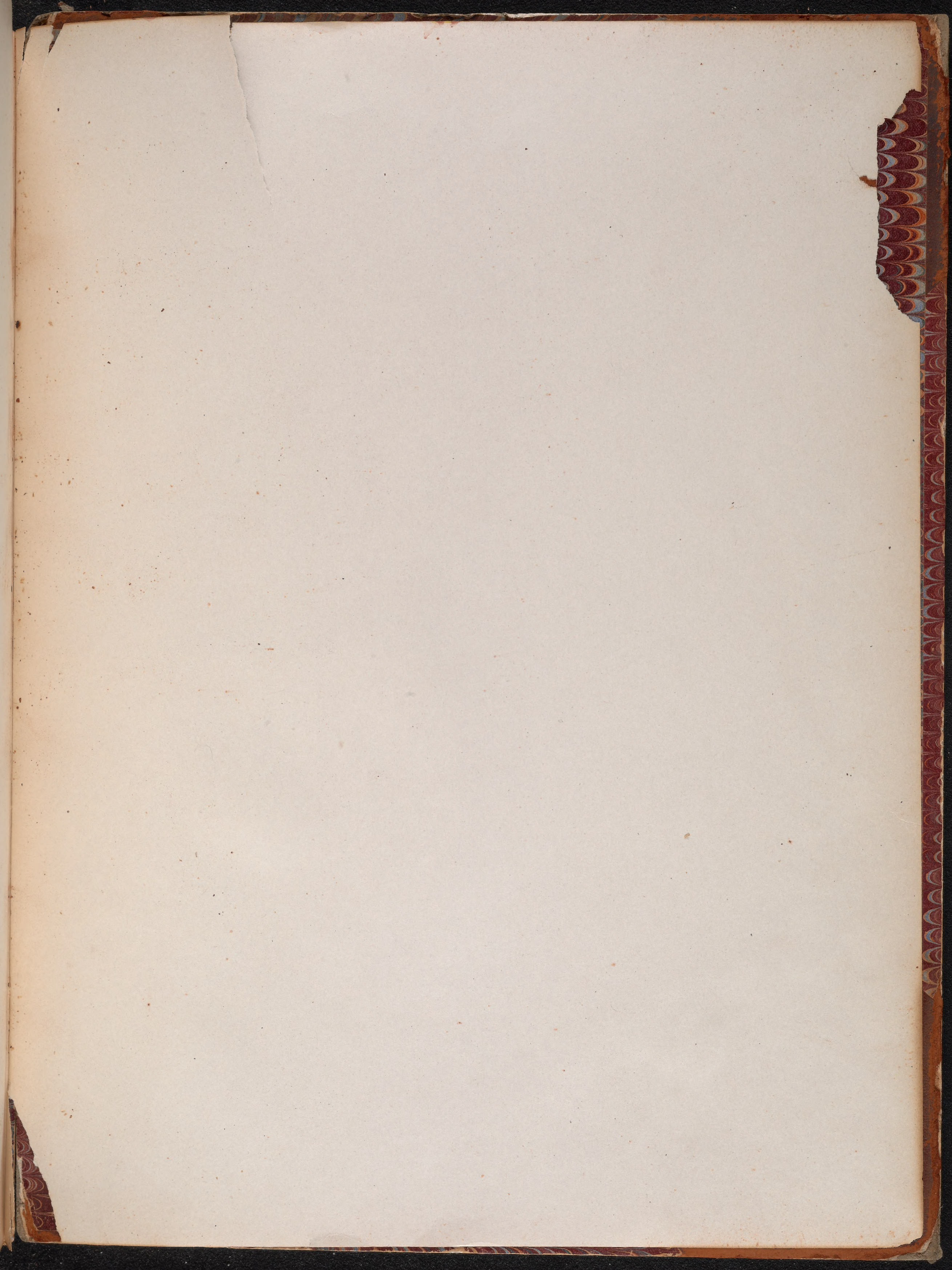
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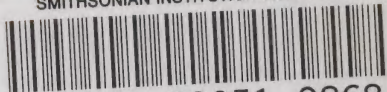






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